Interview
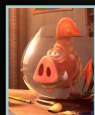Sze Jones

The Gallery
Andrew Hickinbottom,
Marek Denko, Gregory Callahan & more!

FREE Inside Look
Digital Art Masters: Volume 4 Project Overview
by Rudolf Herczog

Project Overview
"Neo-Renaissance Girl"
by Zoltan Miklosi

DOWNLOAD RESOURCES

- Free Low Poly Mapped Base Mesh
- Free ZBrush Torso Base Mesh
- Free Reference Base Image

Cover Image | Hoteru no aoi © Andrew Hickinbottom

PERFECTING
YOUR RENDERS

Next-Gen Character Creation
Joseph Harford, Gavin Goulden, James Busby & John Hayes take us through the mapping & unwrapping stage for **Max, Maya, LW** and **modo**

Destroyed Bunker
Richard Tilbury continues with the theme of destroyed and damaged buildings in part four of our **Photoshop for 3D** tutorial series

ZBrush "Manimal" Creation
Federico Scarbini brings us our latest freak of nature with his interpretation of the topic, "Insect-Man"

Creating Custom Textures in Photoshop
Richard Tilbury focuses on aging our scene by applying dirt and grime in the concluding part of this tutorial series

EDITORIAL

Welcome to Issue 50 – the big 5-0! I hope you love the front cover artwork as much as we do – that would be the talents of **Andrew Hickinbottom** shining through in his latest character illustration, *Hoteru no aoi.* We're really pleased to be able to feature this image in our October gallery; hop on over to P.16 to see more great artwork from this month's featured artists, before getting yourselves stuck into our latest offerings…

First up, we have a very special interview with Blur character modeling supervisor, **Sze Jones** (P.8). Having worked on characters such as *Aeon Flux*, *BloodRayne* and *Lara Croft*, Sze has a portfolio that is guaranteed to impress, and not only do we have all those fine examples of character models that she is so well-known for, but we also proudly feature some of her recent sketches, too – so there's plenty to get your teeth into, people!

So that's the gentle stuff covered; we've checked out the gallery and got our fill of inspiration from industry professional, Sze Jones. Now onto something a little more taxing: tutorials, tutorials, tutorials!

Those of you who've been following **Richard Tilbury** will want to check out the final chapter in the CUSTOM TEXTURES tutorial series (P.56) – remember we gave away a rather generous set of *Total Textures* for free to accompany the first chapter of this series (August 2009 Issue), so if you want to play catch up you can grab the back issues here: **www.3dcreativemag.com/issues.htm**

Our NEXT-GEN CHARACTER is progressing rather nicely this month as we welcome back **Joseph Harford, Gavin Goulden, James Busby** and **John Hayes** to tackle the mapping and unwrapping chapter for 3ds Max, Maya, LightWave, and modo (P.82). Next month: normal mapping and texturing, so stick around!

For all those ZBrushers out there, we have **Federico Scarbini** with us to take us through his response to the brief, "Insect-Man". Federico leaves no stone unturned in his research of the subject for the latest in our MANIMAL tutorial series, and the results are really quite something: great design, detail, with beautifully atmospheric lighting and rendering to set the whole thing off (P.42)!

So that leaves our PHOTOSHOP FOR 3D series – one of my favorites this month! **Richard Tilbury** takes one of his latest renders of a destroyed and damaged bunker scene, and shows us how to utilize Photoshop to great effect, dabbling with the Curves, Levels, and Color Balance Image Adjustments, as well as Layer Styles and the Photo Filter (P.28).

To wrap up this issue we have the making of *Neo-Renaissance Girl* by **Zoltan Miklosi**, which was created using the freeware, Blender, along

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EDITOR	LAYOUT	CONTENT	PROOFING
Lynette Clee	Layla Khani	Lynette Clee	Lynette Clee
	Matt Lewis	Tom Greenway	Jo Hargreaves
LEAD DESIGNER		Richard Tilbury	
	MARKETING	Chris Perrins	
Chris Perrins	Jo Hargreaves		

FREE STUFF!

Wherever you see this symbol, click it to download resources, extras and even movies!

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with Photoshop (P.66). This is just one in a set of stunning character illustrations that Zoltan has modeled and rendered in Blender, and we're sure we'll be seeing plenty more from him in the future, too.

Don't forget we also have a free chapter for you from our recently released *Digital Art Masters: Volume 4* book over on P.73, where **Rudolf Herczog** talks us through the creation of his sci-fi scene, *Fluid X*.

Next month: we interview **Alex Alvarez!** Don't miss out, subscribe now and stay tuned to 3DCreative; we're working hard to bring you some great new series' in 2010, and we can't do it without your support, so happy reading, and we hope to see you all again here next month!

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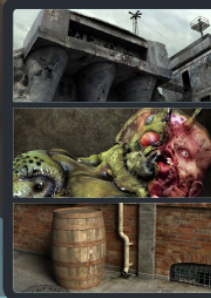
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If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!
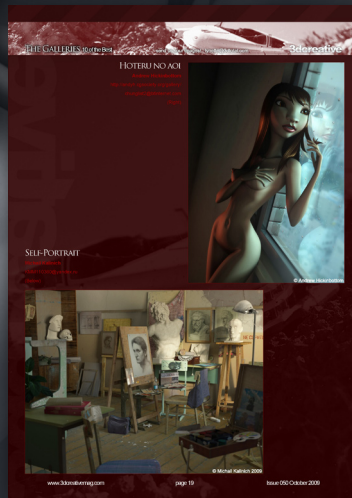
SETTING UP YOUR PDF READER

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the VIEW menu, then PAGE DISPLAY;
3. Select TWO-UP CONTINUOUS, making sure that SHOW COVER PAGE is also selected.
That's it!

CONTRIBUTING ARTISTS

Every month many artists from around the world contribute to 3DCreative magazine. Here you can read all about them. If you would like to be a part of 3DCreative or 2DArtist magazines, please contact: lynette@3dtotal.com

NEXT GEN CHARACTER

This tutorial series provides a comprehensive guide through the process of creating a 3D character intended for use within a next-gen console environment. **Joseph Harford, Gavin Goulden, James Busby** and **John Hayes** tackle this new series providing versions for 3ds Max, LightWave, Maya, and modo
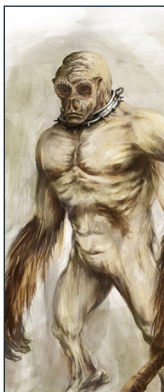
RICHARD TILBURY

Has had a passion for drawing since being a couple of feet tall. He studied fine art and was eventually led into the realm of computers several years ago. His brushes have slowly been dissolving in white spirit since the late 90s and now his graphics tablet has become their successor. He still sketches regularly, balancing his time between 2D and 3D.

http:// www.richardtilburyart.com

GAVIN GOULDEN

Freelance Character Artist based in Vancouver, BC. He has several years' experience ranging from mobile to next generation games, and specialises in creating high detailed characters. He has contributed multiple tutorials to the community, and can often be seen posting on game art forums and participating in game art competitions.

http://www.gavimage.com

gavin@gavimage.com
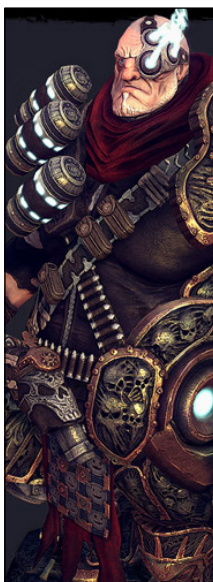
JOSEPH HARFORD

An avid artist since childhood; after freelancing in advertising and film he worked in the games industry at Crytek GMBH, the German games company behind *Far Cry* and *Crysis*. He later moved to Ubisoft as a senior character artist, and has since founded ShineLabs, a digital asset and artwork company, where he currently works.

http://www.josephharford.com

http://www.shine-labs.com

JAMES BUSBY

After working in the industry for about seven years on everything from games to television ads, James setup his own Sheffield based company, Ten24.info, in 2008, which provides assets for all sectors of the media. He hopes his version of the next-gen tutorial series will be useful to those wanting to pick up LightWave as a character modeling tool.

http://www.ten24.info

jamie@ten24.info
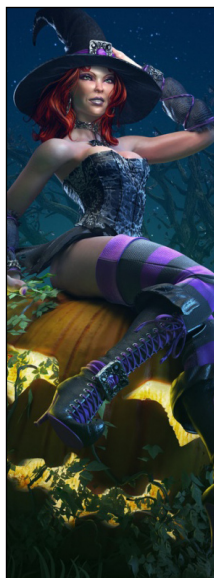
JOHN HAYES

Coming from a 2D background, John started in game development in 1996 as a concept artist and character artist. The first few Nintendo games improved his 3D digital skills and techniques for game development. He then joined Capcom as a senior character artist, moving into character lead, followed by his role at Sega as senior character artist and then character art lead.

http://zugok.cgsociety.org | zugok@sbcglobal.net
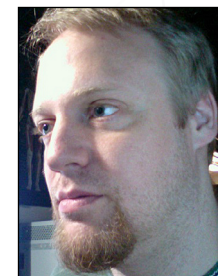
SZE JONES

At 16 Sze was sent abroad to further her education, where she fell in love with computer graphics. She graduated with an MA in computer animation, and shortly after graduation she began working in the industry as a character modeler at a local game company. She's currently working for Blur Studio – now in her eighth year – where she works as character modeling supervisor.

http://szejones.com/ | sze@blur.com
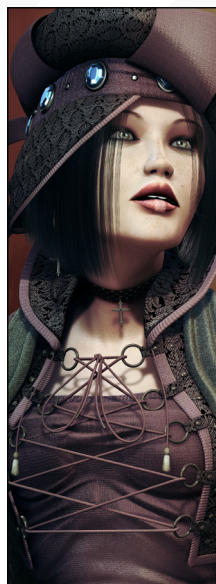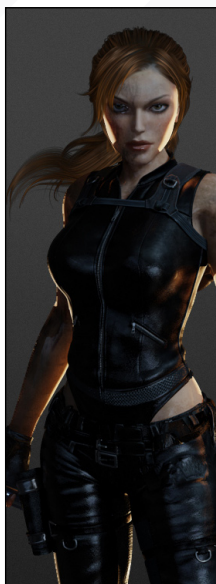
ZOLTAN MIKLOSI

An artist from Budapest, Hungary, where he has been living since he was born – all of his memories connect to the city. After college he took a course to become a DTP operator – CG was just a hobby until 2002. He never thought he would be a 3D artist 10 years ago, but he is very happy and proud that he is.

http://visualworks.atw.hu

miklosiz@freemail.hu

WOULD YOU LIKE TO CONTRIBUTE TO 3DCREATIVE OR 2DARTIST MAGAZINE?

We are always looking for tutorial artists, gallery submissions, potential interviewees, 'making of' writers, and more.

For more information, please send a link to your work to: lynette@3dtotal.com

FishePig Image by Anatoliy Sidorov

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SZE JONES

From a fascination that stemmed from an early age to a dream job at Blur Studios as a character modelling supervisor, Sze Jones's career has really taken off. Forging herself as a key member of the Blur Studios team she has built up an impressive portfolio, focusing on female character creation and modelling the likes of Aeon Flux, Blood Rayne and Lara Croft. We delve into her life in our latest 3DCreative interview.

INTERVIEW WITH SZE JONES

Hi Sze, could you introduce yourself to our readers please and tell us a little about how you first got started in 3D? Where did you study? And what was your first job in the industry?

I have studied three major disciplines since childhood: dance, music and art. Not until my second year of college did I stumble across a course in special effects for television and film and caught part of an intro class that looked at how the magic of movies was made.

I got really into it and start signing up for classes relating to that subject. I remember back then that computer graphics were only green lines on a black screen; to model was basically typing in numeric numbers and then using a function to make an object. Combining this with some video editing and paint programmes and I realized that here was the perfect medium to satisfy my three major interests.

It was so fascinating to me. I continued to study computer graphics and took lots of other art-related workshops at night. After I had completed the Master of Arts program in Computer Animation, I got my first job at a local games company. I then worked in New York for two years at a 3D online e-commerce company, Viewpoint. While I was there I was doing character designs, modeling and animation, coding in XML and making 3D models for e-commerce products.

I am currently working at Blur Studio, as a character modeling supervisor, and this is my eighth year with the company. My job includes maintaining and managing character modeling pipelines, facial expressions, hair setup, artistic direction and specializing in female heroine creation.

As mentioned above, you're currently working for Blur Studio as a character modelling supervisor. You've been there for some time now - what is it about this particular studio that has made you stay?

It's definitely the passion for game cinematics and character creation. I have been playing games since the Atari came out. My father used to work at an Atari game store when I was a little girl and my mom would bring me and my brother to play in the store room when visiting

SZE JONES © 2009
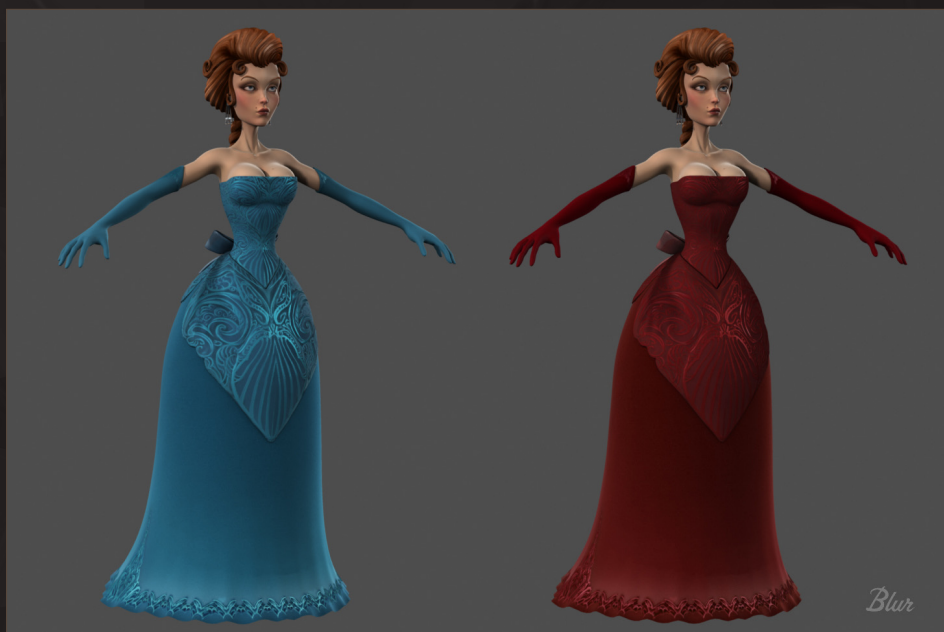
him in the off hour. I love being the character in a game; it takes me to another world and it's so much fun to complete dangerous missions, gain supernatural abilities, solve bizarre puzzles, come up with strategies and all those other little things - it all sparks my imagination.

When I was in school I was fascinated by characters created in games like *Tekken*, *Tomb Raider, Resident Evil* and *Castlevania*. And when *Final Fantasy* came out I was in an underground game shop in China Town, New York City watching the cinematic for the first time. I was so amazed and awed by what I saw and decided that it was my dream to work on something similar to that. I continued to work and study hard in school, and little by little I learned and practiced. I accumulated precious experience by choosing the paths I felt right about. I finally found my dream job at Blur Studio, and character creation is still my love. That's the main reason why I've been here for eight years now!

So what kind of things does a character modelling supervisor get up to?
When I was first hired at Blur, there were no character modeling supervisors. And the pipeline was not developed yet. I remember many characters were still named for primitives, like sphere01, box11, etc. I started to feel the frustration the artists felt down the pipeline, especially in terms of the rigging. It is very inefficient to work on characters without proper naming conventions, and file structures. I started to ask what they needed and started organizing my scene by using names that make sense to

them. It seemed to help them and the naming convention was created for the pipeline.

Translating this into the file structure was more of a battle. Everyone wanted something different and it took many iterations of reworking the folder structure until all departments were happen with what was on paper.

Getting the entire team of modelers to conform to the naming conventions was difficult as well. However, after much talking and convincing, it finally caught on and people started to realize that even though it took a bit of extra time to rename the parts, it was really helping others.

As time went on, we developed a list of technical checkpoints for scene assembly and other miscellaneous information that it's easy to forget. It was basically a QC list - Quality Control. Initially I went over it and checked it against the rigging pipeline so that it saved them time by making sure that they weren't having to solve any problems that should have already been resolved by the character modelers. Several years later, we hired a great scriptor and he complied my list of technical checkpoints


Emmera

and created the QC tool. Most processes are automated now and there are also other artists stepping up to helping out with the checkpoints.

We have a meeting every other two months to share tips and tricks and ask for what is needed. And there is a life drawing session every other week; I try to get a professional figure model to pose for us so that we can study form and anatomy in various poses and lighting conditions. I also help out with any technical issues relating to character modeling and, when needed, I'll help out on artistic direction for female character creation. And that is the summary of my role at Blur Studio.

Wow it sounds like you've made a big impact whilst you've been there, and cool, your own life drawing classes at work - I bet that goes down well in the studio! Stepping away from the work side of things, what kind of motivational things do you and the Blur team like to get up to? And what has been the craziest thing you, or in fact anyone, has done?

We used to play paintball with Blizzard in the
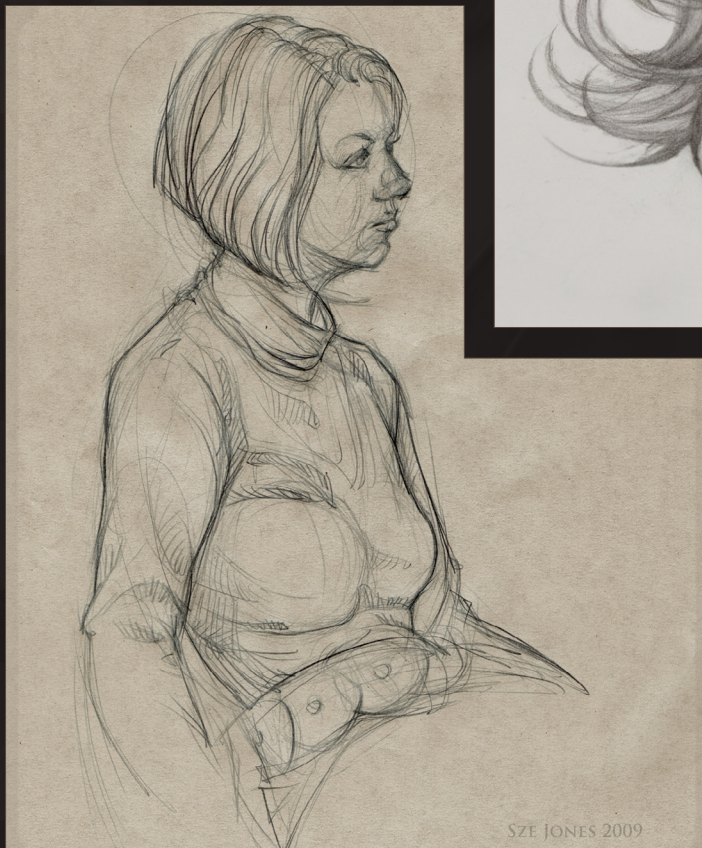
early years. It was a lot of fun and pretty intense; I painted my mask white and added bloody teeth to it, which wasn't such a great idea because I became an easy target! I also liked playing nurse/medic, and I volunteered to be the ammo girl to carry ammo for our teammates. We had a couple of real ex-Marine and military guys teaching us the hand signal and tactics. It was a rush and was really fun! Another motivational thing that the Blur team does is call the "Sculpt Klub". One of our concept guys hosts a sculpting session and I joined them last year and worked on a vampire bust; it took a while to finish but I had a blast making her.

The craziest things always happen at Siggraph. Blur usually throws a huge party and last time Carmen Electra came and we had a dance show on stage; I thought that was pretty shocking!

Apart from a fluffy bunny, your portfolio is littered with exceptional sculpts of women, from a scantily clad evil sorceress to the first woman of video games: Lara Croft. So how is it that you've just specialised on this particular gender?
Lara Croft is the first game character that I played as a women in a third person adventure game. It was so much fun and I was really crazy about it. That was also the first time I was able to swim underwater, ride on a motor boat, climb rocks and go though booby traps. It was like Indiana Jones in female form.

I also love martial arts ninja type characters like Ninja Gaiden, Capcom characters etc. My favorites are Chun Li and Felicia, although I'm sure there are other great ones out there. I

didn't play many computer games on consoles while I was at school because I couldn't afford a computer.

Later on I also became really attracted to the fantasy character designs in games like I*cewind Dale*. These were very different characters from those I liked in my childhood and while I was at school, but I loved the sexy, ornate and unique *Everquest* and *Warhammer* type costumes. Characters like Aeon Flux and Blood Rayne were also very fun because they reminded me of the James Bond type assassin girls.

So which has been the most fun to have modeled? And which are you most proud of?
The character I had the most fun with was the

Warhammer Dark Elf Sorceress; she has a very unique personality. To capture her persona I used very strong contrasting colors and a lot of subtle landmarks, such as the veiny pale skin, purple tinted black hair, her exaggerated make up and abnormally long torso and legs. Since her design is so streamline and elegant, I was able to spend more time adding details to her armor, like wear and tear, battle scars and scratches. Working on long hair is a lot of fun as well. I like having her hair weaving in and out of the tiara; making it really puffy and dramatic adds lots of presence to her character, which is good because of the short screen time of the cinematic.

I am the most proud of my Tomb Raider model. As you've probably guessed, I've been a big fan of the game since the very first one came out and it was truly an honor to be able to work on her.

Over the course of producing this magazine we have seen many a great artist work for Blur Studio (yourself being one of my favorites!) Who has been the most influential, and who has been the one person (if any) that has made you think "Wow, they do some amazing work!"
I think that's a really tough question to answer because I think a lot of artists at Blur are really amazing at what they do and they are extremely

determined and dedicated. Every time I walk past one of their monitors I end up thinking "Wow, that looks really amazing ...!" We don't have cubicles and everyone sits in a big open studio space. As a whole I feel that the energy makes us one as a studio. We can sense the vibe and energy every artist is given out even without talking.

The most influential person I can think of is Tim Miller because he founded Blur and he has gone through a lots of ups and downs with the studio and the artists. And I truly feel that he is the most genuine leader I have ever met. Maybe I am biased, but I think he always stays true to his vision and his dream and never gives up. As an artist at Blur, work can be very challenging and the schedule can be very intense. But the dedication and the enduring visions our artists have are the greatest motivation to keep on doing our best.

One of my favorite pieces in your portfolio is your Dark Elf Sorceress. I don't know much about the lore and style of the *Warhammer* universe, but how much influence did you have in the look of this character?
For the Dark Elf Sorceress in *Warhammer*, I stayed really close to the original concept. I took slight liberties with the look and the make up of the face and skin tone. I added veins to the body and the material and shader of the fabric were also changed. I also played with the body proportion and anatomy quite a bit, like the long skinny fingers, her stomach muscle, curves and the exaggerated puffiness of her hair.

So on average how long would you normally spend on a model like this?
Characters like her would normally take around 15 - 20 days.

Can you recall the most useful piece of advice that you've been give, whether it was from a work colleague or another artist?
Life is about making choices and the experience that you choose to have.

So when you're not slaving away in front of a computer screen, what kind of things do you get up to in your spare time?
My favorite thing to do is to go to an art museum and see the ocean. I also like preparing food, making sushi, wrapping dumplings, marinating

Client: Mythic Entertainment | Project: Warhammer Online: Age of Reckoning: Dark Elf Sorceress

BBQ meat and coming up with crazy ways to make desserts! I recently fell in love with belly dancing; its a great workout, it's very sexy and I like dancing with my teacher and coming up with new dance moves and costumes. Bookstores, cafes, and libraries are great for drawing, reading and relaxing at the same time. I try to do more art by hand - mostly drawings - designing characters and sculpting with wet clay.

Sometimes, when there is a good workshop, I will sign up and try to learn more and explore art with different mediums. Playing music, sculpting with friends and having a BBQ outdoors are the greatest things to do in the summer.

One of my friends occasionally has a video game marathon; we play rock band, bring home-made cooking, watch Kung Fu movies and are just generally silly.

Yeah I noticed the belly dancing clip you had on your website. You look very professional at it! Did your passion for dance spur you to do this or was it a case of "this looks like fun"?
Belly dancing is one of my favorite dance forms. I was a ballet dancer for 10 years when I was a teenager, but I was really discouraged by the experience. The training was really formal and the routines were not very creative.

However because of the ballet dance background I was able to pick up the dance moves for belly dancing quite quickly, and the most creative part of belly dancing is the choreography. The teacher that dances with me in the video is like one of the characters I create in fantasy stories. I really look up to her; she is really encouraging and very disciplined. I started training with her and she has taught me more than dancing; I've learned a great deal about how to enjoy dance and be creative about it. We are going on a dance journey! The dance on the site, it was choreographed by her and we have performed it many times before. The performance looks professional because of the amount of hours we have practiced.

I think dance is a very beautiful form of art and it's just like drawing and sculpting. It takes a lot of creative juice and discipline. I hope in the future I can dance more and come up with some choreography along with my teacher.

Well it has been a really pleasure chatting with your Sze and I wish you all the best for the future. One last question before we wrap this interview up: You've modeled a variety of female characters over the years, but if you could immortalize yourself as a 3D character, what genre would you like to be set it and what characteristics would you give yourself?
I would love to be a vampire, because as an artist I think it would be amazing if I could keep on making artwork for an eternity and be able to dance until I am 3000 years old and wear cool costumes! But I don't want to drink human blood ... maybe I could be a half breed and drink red wine instead!

THE GALLERY

THE GALLERIES 10 of the Best
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3dcreative

FREAKY ROBOTS

Mattia Mazzucchelli

http://www.opinelz.net

info@opinelz.net

(Above)

STEAM TRAVELER

Andrew Averkin

andrewaverkin@yahoo.com

(Left)

MILITARY ROBOT

Łukasz Pająk

http://www.monkey-graphics.pl

lukpajak@gmail.com

(Right)

CANALCAM

Martin Balcar

http://www.creoshop.eu

martin@creoshop.eu

(Above)

Roller Bunny

Gregory Callahan

http://gcallahan.com

sasquatchpoacher@gmail.com

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Gregory
Callahan '09

Hoteru no aoi

Andrew Hickinbottom

http://andyh.cgsociety.org/gallery/

chunglist2@btinternet.com

(Right)

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Self-Portrait

Michail Kalinich

KMM110380@yandex.ru

(Below)

© Michail Kalinich 2009

PIRATE HYPE

Pao (Thitipong Jitmakusol)

http://www.iampao.com

iampao@gmail.com

ELDORADO

Marek Denko

http://www.marekdenko.net/

marek.denko@gmail.com

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Eldorado

NEXT GEN
CHARACTER
CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Follow

The forth chapter will focus on a vital part of the pipeline in readiness for the texturing phase, namely the mapping and unwrapping. It will provide an insight into various approaches to mapping and show how to go about exporting a wireframe template to be used as a guide in preparation for the next chapter.

So if your interested in seeing the forth chapter of this amazing new series, please flip to the back of this magazine and enjoy.

ZBRUSH   3ds max   lightwave   Maya   modo

Auto-Select: Group   Show Transform Controls   Workspace ▼

"PHOTOSHOP CAN BE USED TO REFINE AND MODIFY YOUR RENDERS TO A GREATER OR LESSER DEGREE, OR INDEED AS A WAY OF COMPLETELY TRANSFORMING THE MOOD AND LIGHTING."

Photoshop for 3D

This series of tutorials aims to show the value of post-production and more specifically the ways in which Photoshop can be used to aid the 3D pipeline. Over the course of six chapters we shall focus on the various tools and techniques on offer in Photoshop that are frequently used to improve 3D renders. Compositing passes, adding particle effects, improving lighting and making general colour adjustments are a few of the topics covered, as well as ways to create backgrounds that both complement and enhance characters. The methods presented within this series can provide an efficient alternative to lengthy render tests and experimenting with numerous settings, and will enable artists to seamlessly blend 2D techniques into a 3D process, resulting in a versatile and streamlined workflow.

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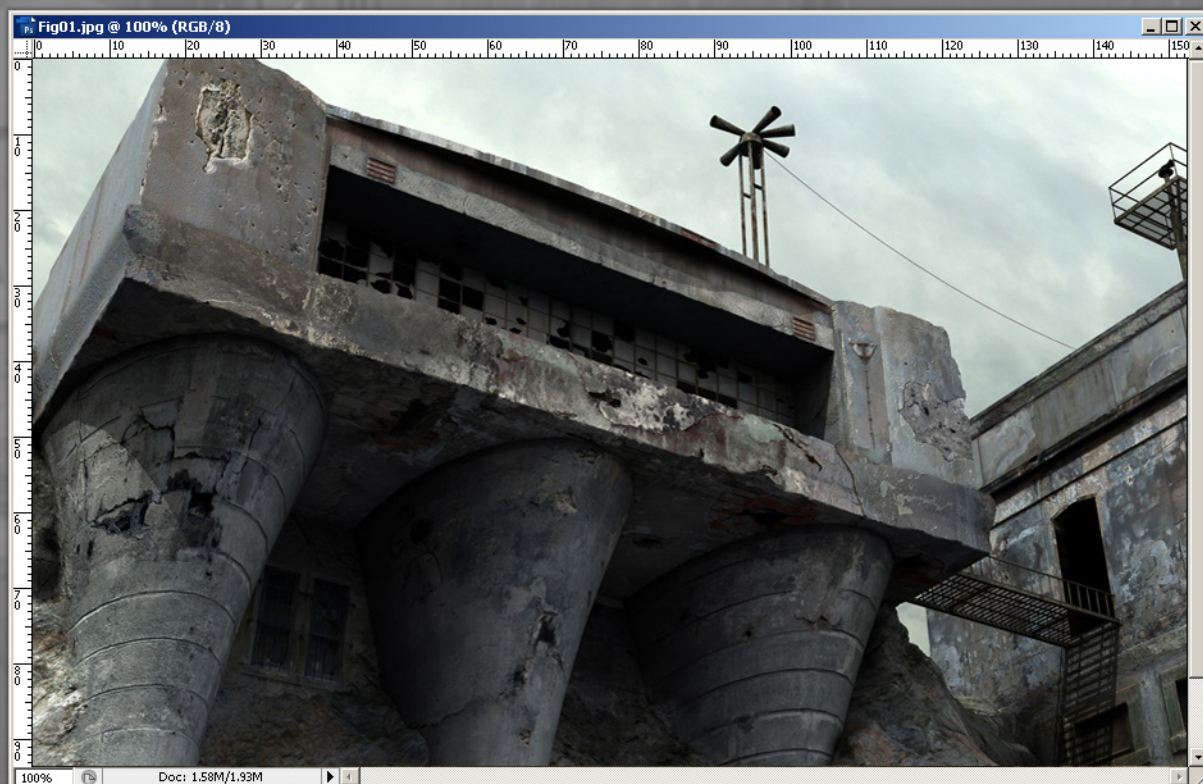
CHAPTER 1
Render Passes

CHAPTER 2
Retouching Final Renders

CHAPTER 3
Lighting & Special Effects

CHAPTER 4: CURVES, LEVELS, COLOUR BALANCE & LAYER STYLES

This chapter is devoted to Photoshop's Image Adjustments which are a very powerful way of changing the colour balance and tonal range within an image. The tools on offer here afford artists the flexibility to change the mood and atmosphere of their 3D renders without the need to alter light rigs and the plethora of parameters that accompany them.

CHAPTER 5
Layer Masks & Adjustment Layers

CHAPTER 6
Creating Backgrounds

CHAPTER 4: CURVES, LEVELS, COLOUR BALANCE & LAYER STYLES

Software Used: Photoshop

INTRODUCTION

In the forth workshop of this tutorial series we'll be taking a look at some of the most commonly used techniques and tools in Photoshop to modify a 3D-render during the post-production phase.

The bulk of the tools we will look at are situated within the Image > Adjustments menu, as shown in **Fig.01**; most notably, Curves, Levels, Color Balance, and Hue/Saturation. We will also touch on some of the available Layer Styles and how these can be applied to your renders.

Photoshop can be used to refine and modify your renders to a greater or lesser degree, or indeed as a way of completely transforming the mood and lighting. Almost all of the effects are possible within a 3D environment, but as this tutorial will hopefully show, using Photoshop can prove a quicker way to tweak your lighting and color scheme and make the minor changes you require. Even if the results are sometimes not as physically accurate as a 3D render, by experimenting with the following techniques means that you can get an accurate picture of what you may wish to achieve back in the 3D scene. We can therefore use Photoshop to improve and alter our 3D renders, or simply as a way of exploring alternative ideas that can then be applied in 3D.
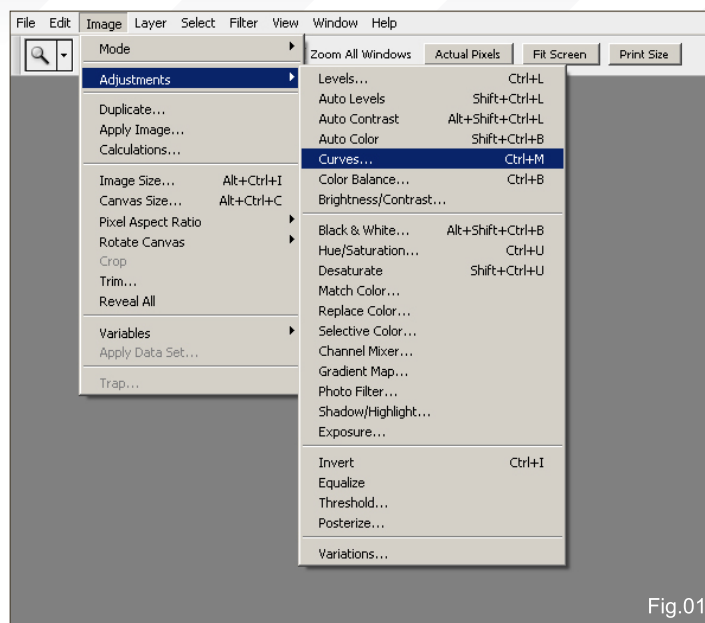
Fig.01

In this tutorial we will cover a brief overview of the above mentioned tools, and then look at some practical examples of how these can be applied to our 3D renders, using a base image which has been created to promote the Total Textures V19: Destroyed and Damaged DVD (www.3dtotal.com/textures) collection (**Fig.01a**).

LEVELS

The first tool we'll look at is **Levels**, which you will find under Image > Adjustments. When you open up this tool you'll see the following dialogue

Fig.01a

box (**Fig.02**). There are two main sliders which affect the image: the Input and Output levels (top and bottom, respectively).

The two outer sliders on the Input Levels correspond to the black and white values in the image – black being a value of 0 and white being a value of 255 – and these determine the darkest and lightest areas on the Output Levels.

In **Fig.03** you can see the original version on the left, where the four outer sliders are at the extreme edges. When the Output sliders are moved inwards, the contrast is reduced, meaning that the black value is made lighter and the white made darker. When we OK this and then re-open the Levels, we can see that the range within the Input Levels corresponds to the adjustment as shown by the red lines
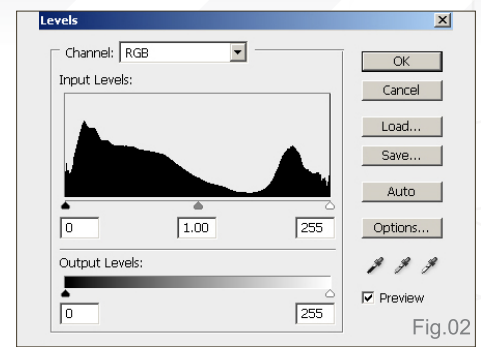
Fig.02
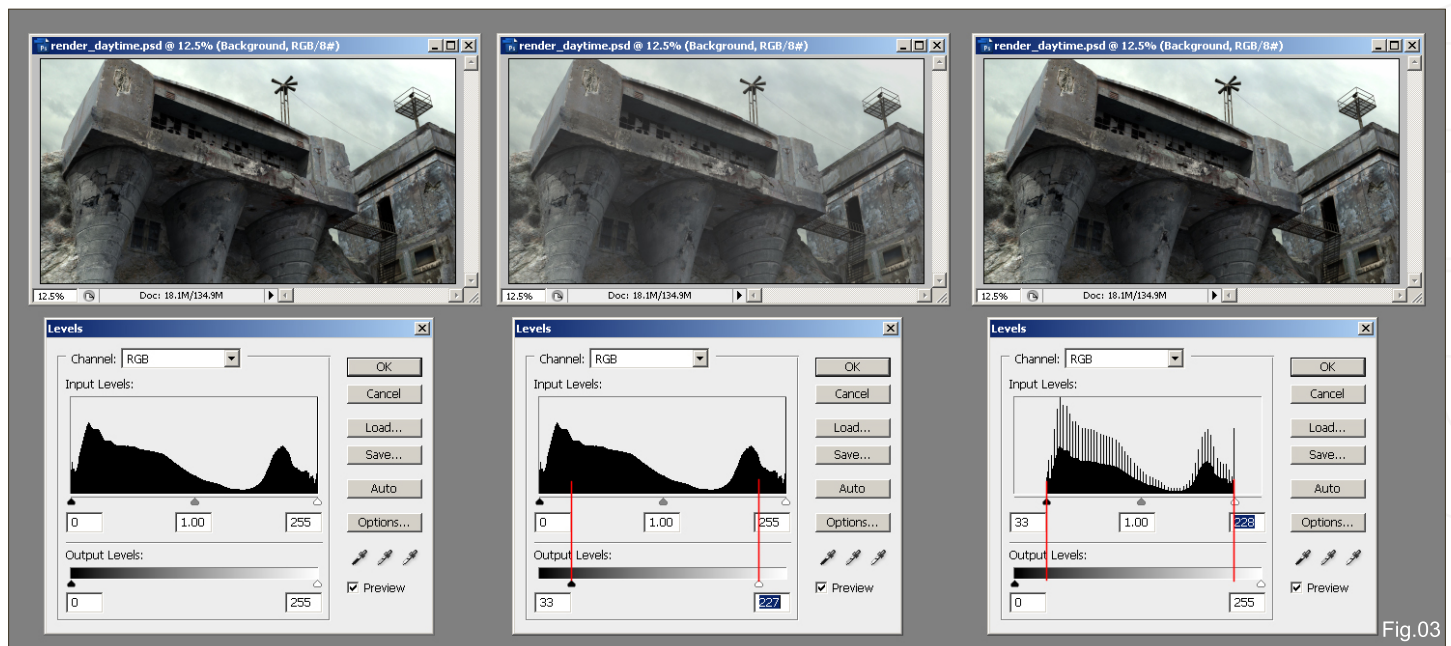
Fig.03
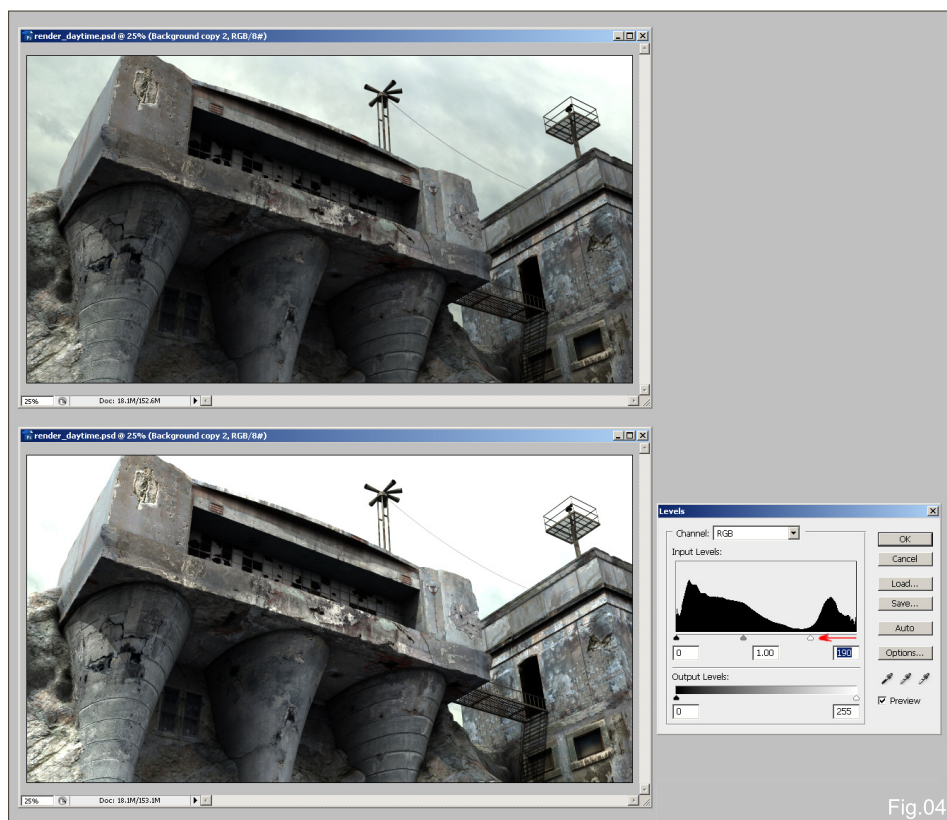
(middle and right image). To adjust the shadows and highlights manually, or return the values, we must now move the Input sliders to the outer edge of this new range, thus returning the black value to 0 and the white to 255, as seen on the left. This means that all pixels with a value of 33 and lower will be set at 0 and those of a value of 228 and higher will be set at 255. The middle slider affects the midtone range, and by moving it left makes the image lighter, and vice versa.

If we apply Levels and slide the right arrow inwards on the Input slider, we can brighten up the render and give the impression of a stronger sunlight (bottom image in **Fig.04**). Because the sky is the brightest area without much contrast, the adjustment has rendered it almost completely white. If you wish to avoid this you could have a separate render pass of just the buildings and apply it to the foreground only, which would enable individual control of both the

Fig.04

buildings and the sky. Alternatively, if you save out the render with an alpha channel that carries a mask for just the buildings, then you could experiment by pasting in various skies to reflect the foreground conditions.

CURVES

The **Curves** image adjustment tool essentially does the same task as Levels, except you have more control over the tonal range. With Levels you have only three adjustments: white, black and mid range (or Gamma). The Curves dialogue box also enables precise control over the different color channels. When opening the Curves dialogue box, by going to Image > Adjustments > Curves, you will see something resembling what is shown in **Fig.05**.

I won't cover every aspect of this as you can find all of the information in your Adobe Help Viewer, but the key things to note are the top right corner of the window representing the highlights, and the opposite corner representing the shadows. You can click on the line to add points and then drag these accordingly to manipulate the tonal range, adding as many as
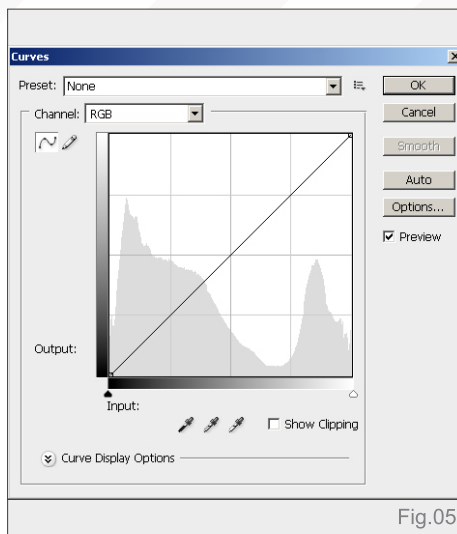
fourteen. To delete a point simply drag it outside of the window.

In **Fig.06** you can see the number of points I have added to the baseline, and the resultant effect is shown in **Fig.07**. The top three points are controlling the sky, whereas the bottom-most point affects the shadow, with the black point affecting the general range of midtones. You can see that by adding numerous points I have been able to brighten up the scene, similar to using Levels, but I've been able to do
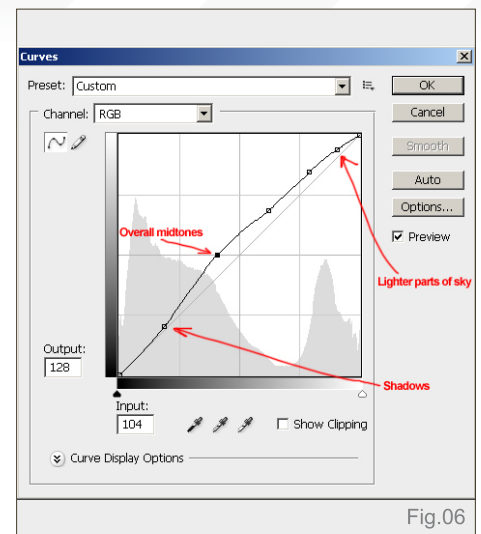
so without bleaching out the sky (compare to Fig.04).

By using Curves you can gain more precise control over the tonal range, but which approach you use depends on the render and artistic aims – both can prove equally useful, especially when combined.

COLOR BALANCE

This command is used to add a tint to the overall image and is very useful when you wish to alter

Fig.05

Fig.06
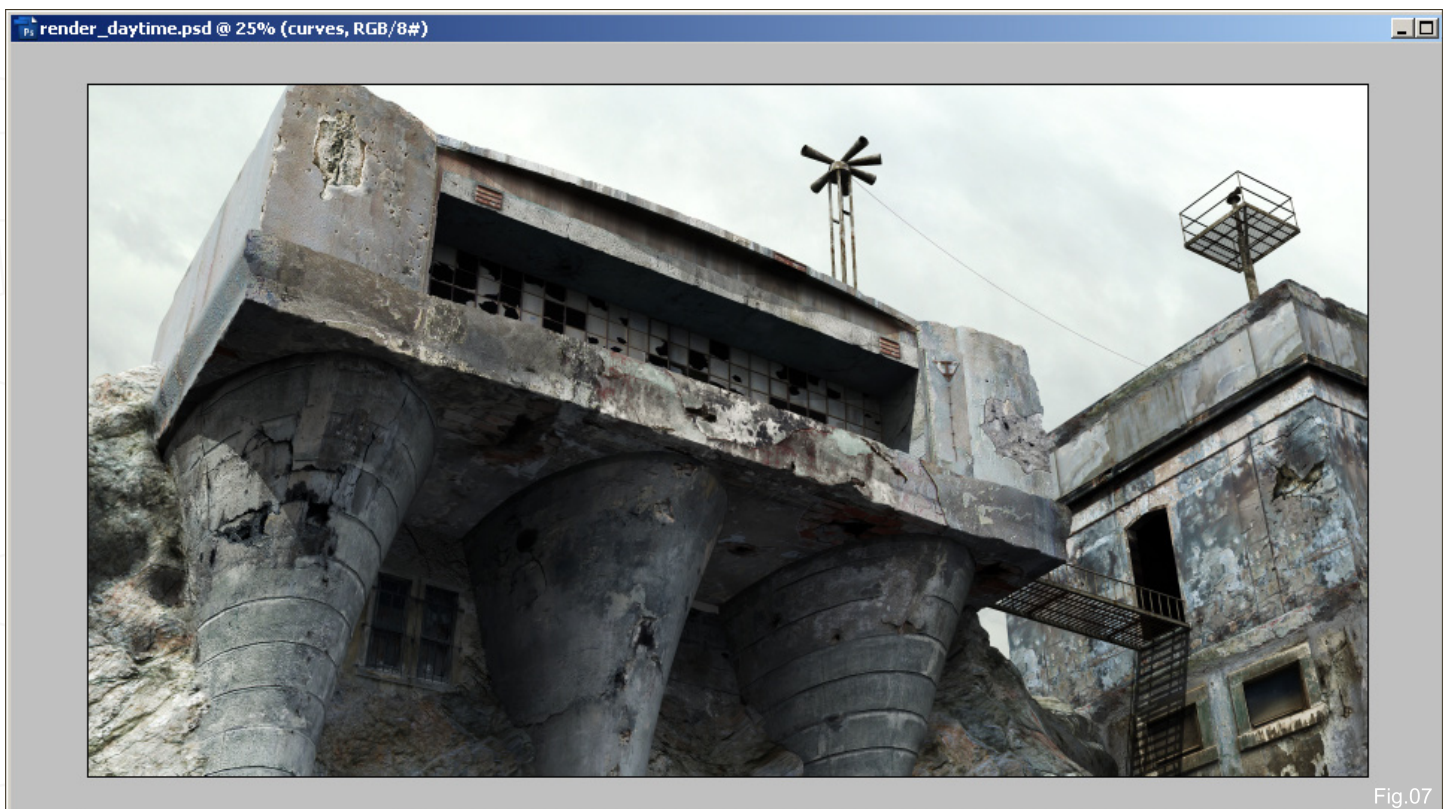
Fig.07

the general color of the lighting conditions. You access these controls by going to Image > Adjustments > **Color Balance**, where you will find a dialogue box similar to that seen at the top in Fig.08. Here I have moved the slider towards Red and Yellow to create a warmer light, perhaps suggestive of early evening. At the base of the dialogue box you will see three radial buttons which allow control over a specific tonal range. In this example, the sky and foreground have been altered individually to allow more control.

Hue/Saturation

The Hue/Saturation adjustment tool allows you to alter the overall hue, saturation and brightness of an image, or alternatively manipulate specific colors. In **Fig.09** you can see the original image at the top, with the unaltered values in the Hue/Saturation dialogue box (i.e. 0, 0, 0).

The bottom image is a version which has been transformed into a nocturnal scene using all three sliders. Hue affects the color, Saturation the intensity of the color, and Lightness controls the overall brightness. At the top of the box is the Edit panel where you can select to modify specific color channels or the overall image, which is labeled Master. These are the key things worth noting and what you will use in most cases, but for a full explanation you can consult the Help menu.

As this image has been turned into a nocturnal scene we could also apply Curves to reduce the contrast and tonal range, as well as making the shadows darker.

These are perhaps the most commonly used tools with regard to manipulating 3D renders in Photoshop, but the best effects will invariably involve the subtle combination of all the above. We will now go on and look at how we can apply some of these tools to create three variations of our bunker scene, as well as cover some useful Layer Effects.
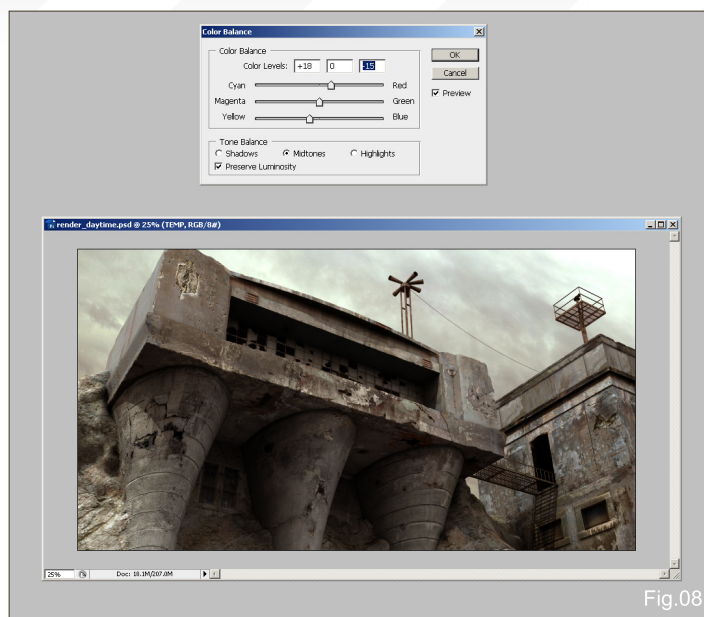
Fig.08
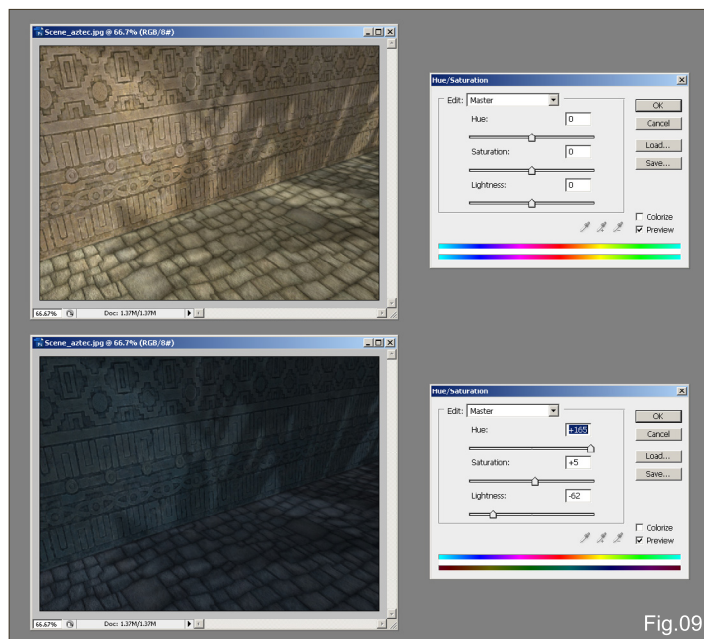
Fig.09
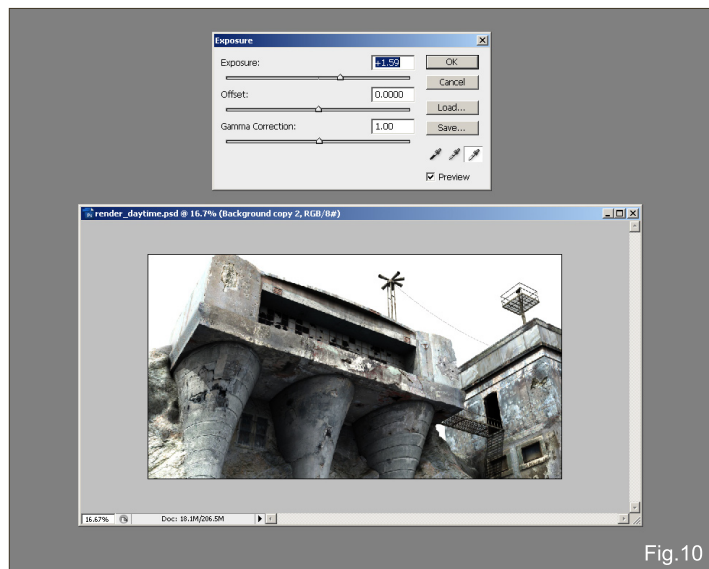
Fig.10

Variation One

The original render looks fine, but to add a little drama and give it a grittier and more dramatic light, akin to some of the photography in the epic series, *Band of Brothers*, we will use the Exposure command (**Fig.10**).

First of all, I duplicate the render layer and then go to Image > Adjustments > Exposure, and then increase the Exposure, which will essentially affect the brightest parts of the scene without altering the areas in shadow. This tool is normally reserved for HDR images, but works well in other instances, also.

You can see that the render now resembles the bleached-out version we saw whilst using Levels, so what we need to do now is to erase some of the areas that appear too light, to reveal the original render below. I've

added a new layer between this one and the original and fill it with red so you can visually see which areas have been erased (**Fig.11**). Using a soft-edged Eraser, I deleted some areas that would receive less or no light, i.e. the underside of the bunker and facing wall of the building far right, as the sun is casting light from left to right.

Using Hue/Saturation, I alter the sky separately and make it a touch darker and less saturated, after which I give it a very subtle green tint by way of the Color Balance tool. This greater contrast creates a more dramatic mood with strong sunlight, and the suggestion of an approaching storm (**Fig.12**).

We have created a more dramatic daytime version of our scene, but let's imagine that we now want to set the clock forwards to late afternoon, somewhere around sunset…

Variation Two

First of all, I make a duplicate of the render layer and then go to Image > Adjustments > Color Balance and shift the palette towards red and yellow, as shown in **Fig.13**.

We only want the sky and roof fixtures from this new layer, but by changing the entire layer we
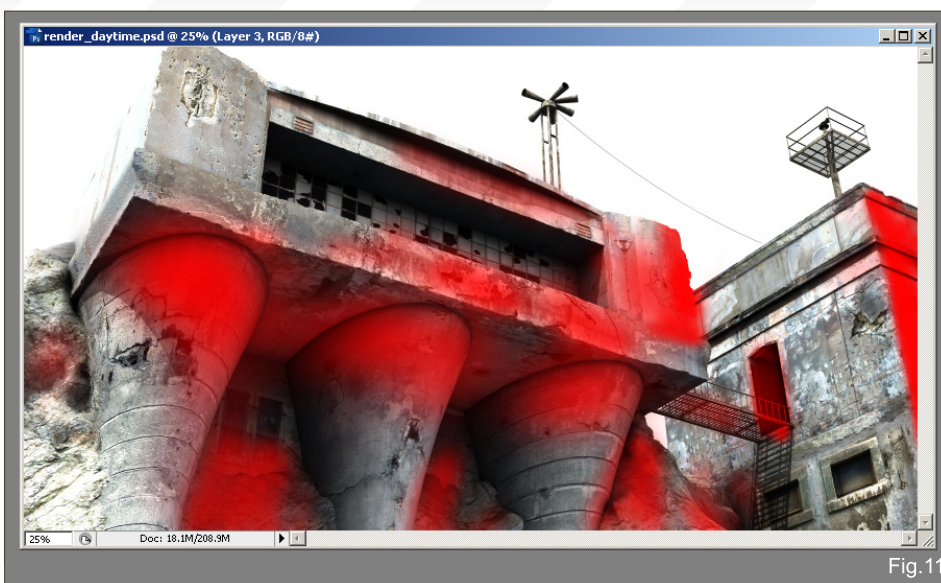
Fig.11

Fig.12
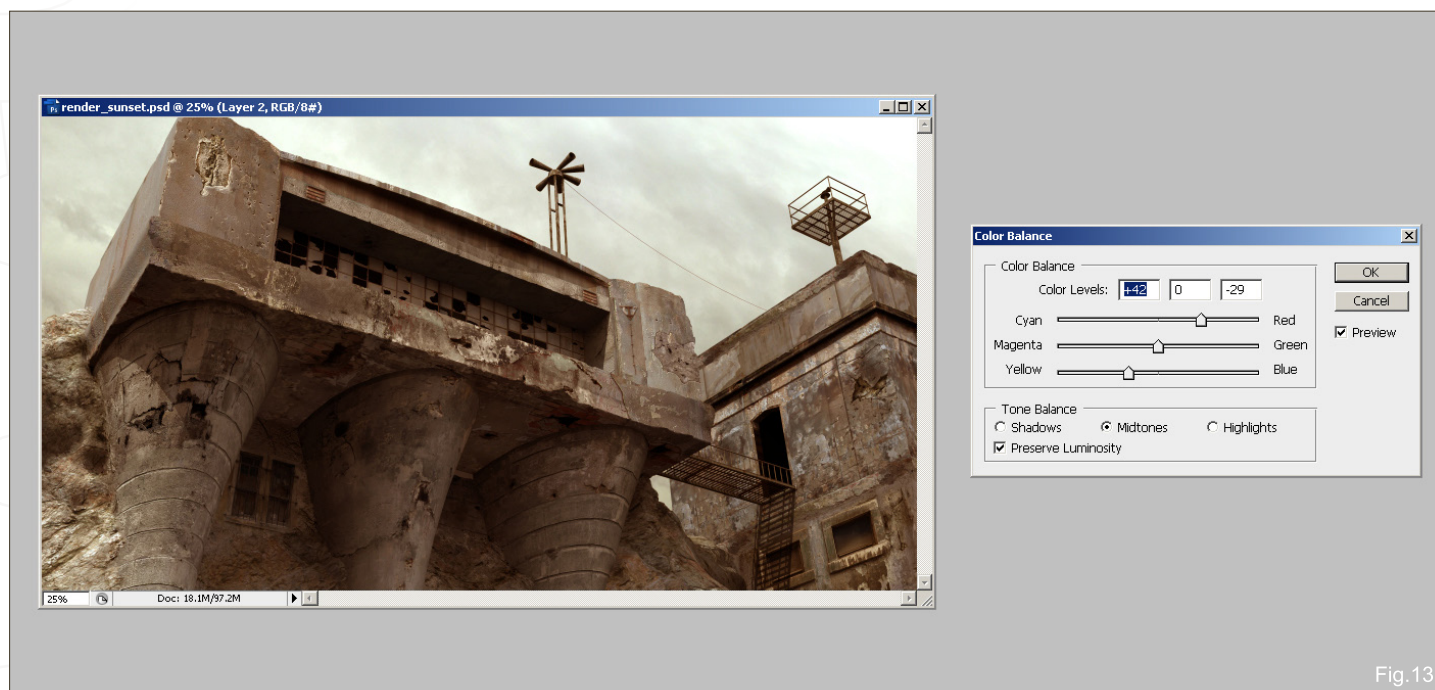
Fig.13

obtain a better idea about the overall light when altering the Color Balance. When satisfied with the settings, I delete the foreground buildings so that we end up with something similar to **Fig.14**.

Now I make a duplicate layer of the original and then place this over the new sky; once done we'll apply a Layer Style to represent the light cast by the setting sun. Go to Layer > Layer Style > Gradient Overlay and you will see the top dialogue box in **Fig.15**. Here you can control the Blend Mode and Opacity of the effect, as well as determine the Angle, Scale, Color and Gradient Type.

Clicking on the Gradient bar to open the bottom dialogue box, I choose a color that is sympathetic to that of the Color Balance adjustment earlier (in this case, a pale orange) by clicking on the small square icon highlighted by the arrow. I also make sure that I select Foreground to Transparent from the upper row of Presets by clicking on the appropriate box. Once the Gradient Type and Color are determined, I hit OK and return to the Layer Style dialogue box. You can now experiment with the Blend Mode and other settings to refine the effect, most of which will be self explanatory.

The Layer structure can be seen in **Fig.16** with the Color Balance layer above the original, of which only the sky and roof attachments are visible. Above this is a duplicate of the
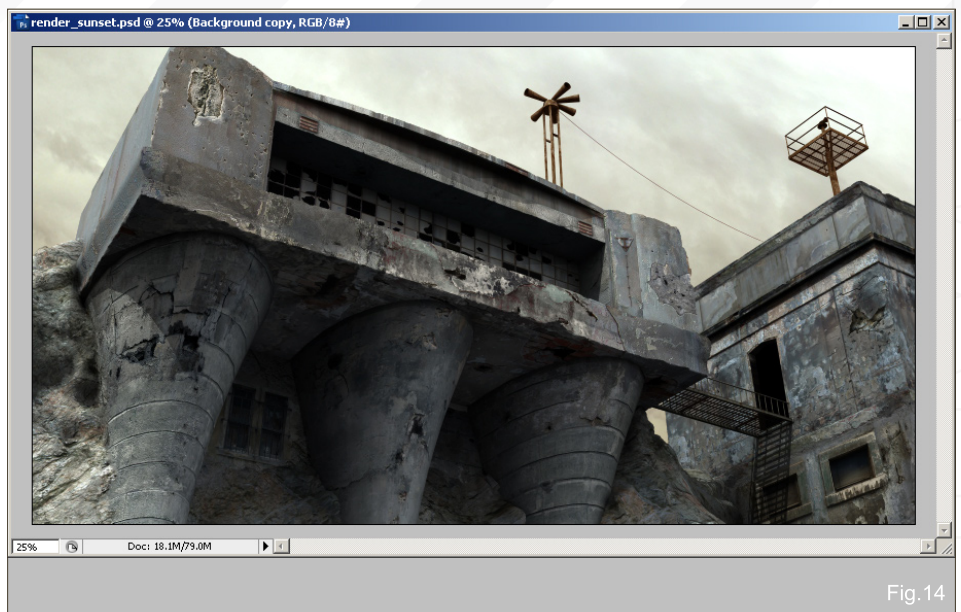
Fig.14
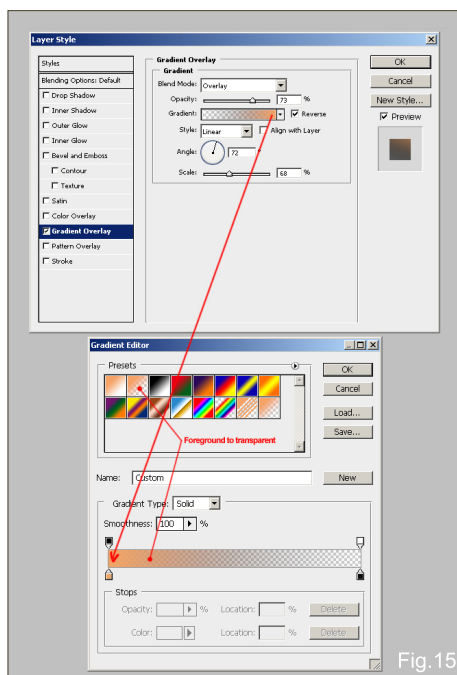
Fig.15
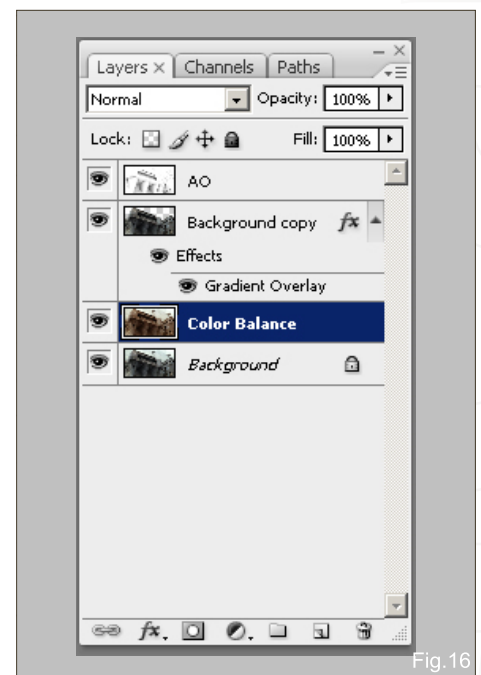
Fig.16

VARIATION THREE

One other commonly used function of Photoshop's Image Adjustments menu, particularly amongst matte painters, is the ability to turn a daylight scene into a nighttime version. To do this, we will, as usual, make a duplicate of the render and then firstly lower the light levels by applying the Hue/Saturation tool. **Fig.18** shows the base render with the appropriate modifications.

I go to Image > Adjustments > Color Balance and move the bottom slider towards Blue, and

Fig.17
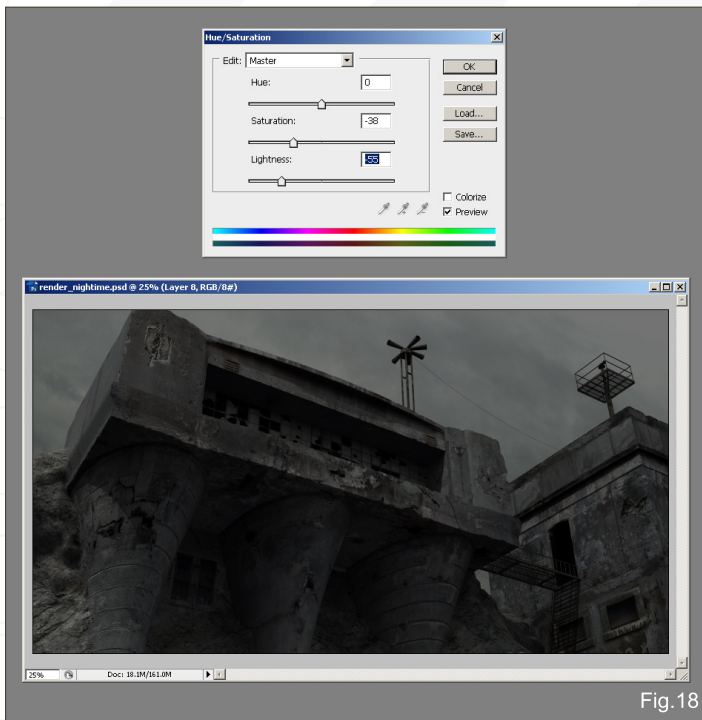
Fig.18
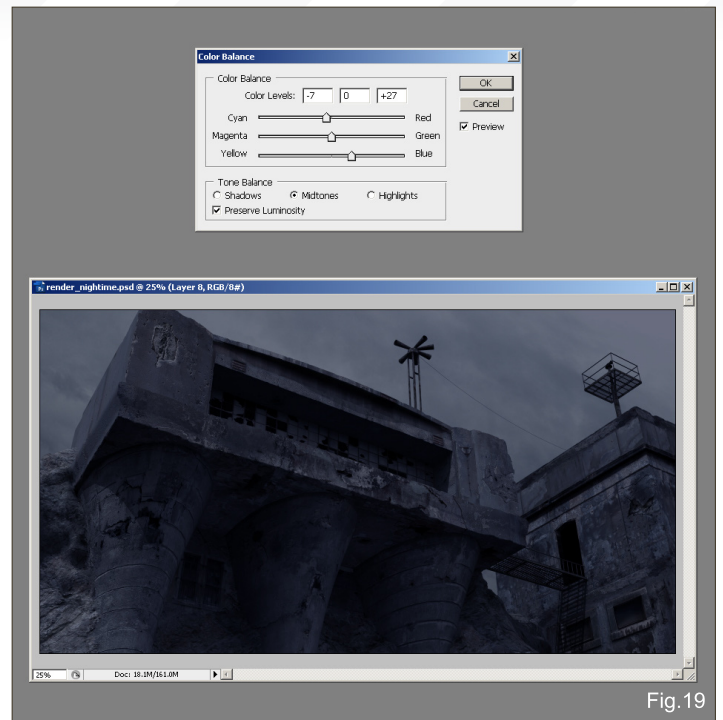
Fig.19

the top one a touch towards Cyan (**Fig.19**). The scene still looks a little too light and rather blue, so I re-open Hue/Saturation and reduce the Lightness and Saturation values once more.

The scene, as it stands, looks a little uninteresting, even though it resembles nighttime, so to improve things we are going to switch some lights on inside the bunker. To do this I either duplicate the window section that corresponds to the glass, or render just

this face in my scene with an alpha channel, meaning I have a readymade mask. With this area put on a separate layer I go to Layer > Layer Style and apply a Gradient Overlay using the settings shown in **Fig.20**. This essentially puts a light inside the building with the source being on the left, gently fading towards the right hand side. The final result is a three tiered effect, as illustrated in **Fig.21**. The above mentioned layer is at the top and below this is a duplicate with all but the left hand windows

deleted. You can see the corresponding Blend Modes in the Layers palette on the right hand side. The final layer seen at the bottom is yet another duplicate (but without the Layer Style) and represents the light source; this one is set to Screen mode at 75% Opacity with the outer edges softened with the Eraser Tool.

One final adjustment that will help is to substitute the sky, and if you can find one with backlit clouds that would be ideal as it
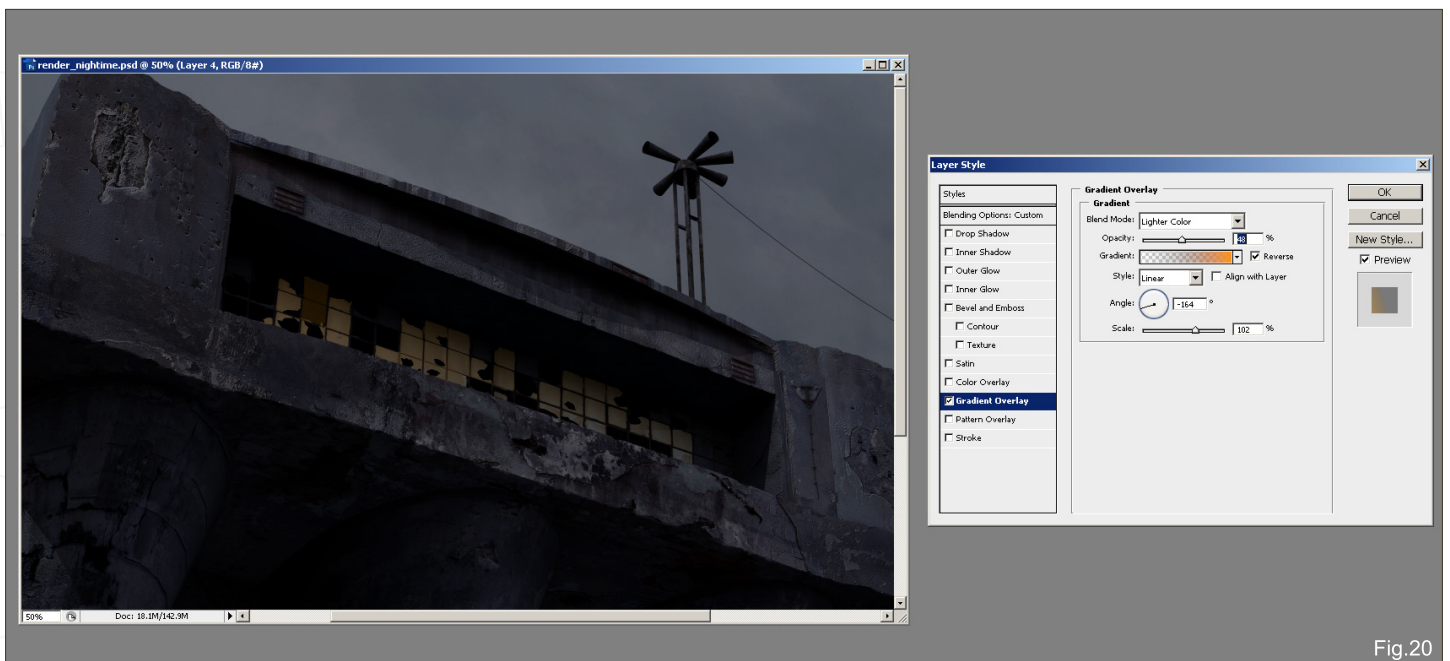
Fig.20

will suggest moonlight illuminating them from behind – this proves very effective for nocturnal scenes!

The final version can be seen here in **Fig.22** and this about covers the principal Image Adjustments, and more crucially, the ones you will most likely use. However, there is perhaps one more worth mentioning … the Photo Filter.

Photo Filter

This tool simulates a color filter being placed over a camera lens; it is again found under Image > Adjustments and can often prove effective, depending on your render.

You can see the effect of adding a warm filter in **Fig.23**, but you can find a list of alternatives under the Filter drop-down menu. As a general rule the warm filters work best with a cool palette, and the cool ones work well under a warmer light, but it is worth experimenting for different results.

Layer Styles

You will notice that we've only covered the Gradient Overlay within the Layer Styles menu, yet there are quite a few in all. So before we conclude
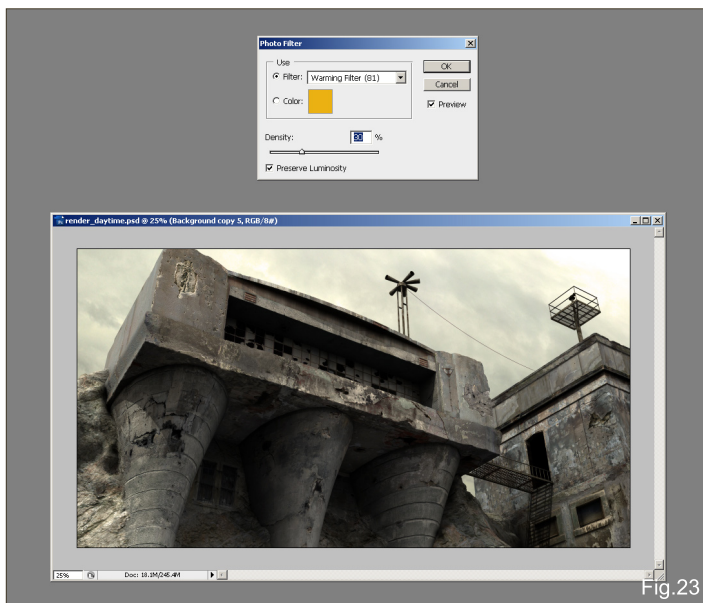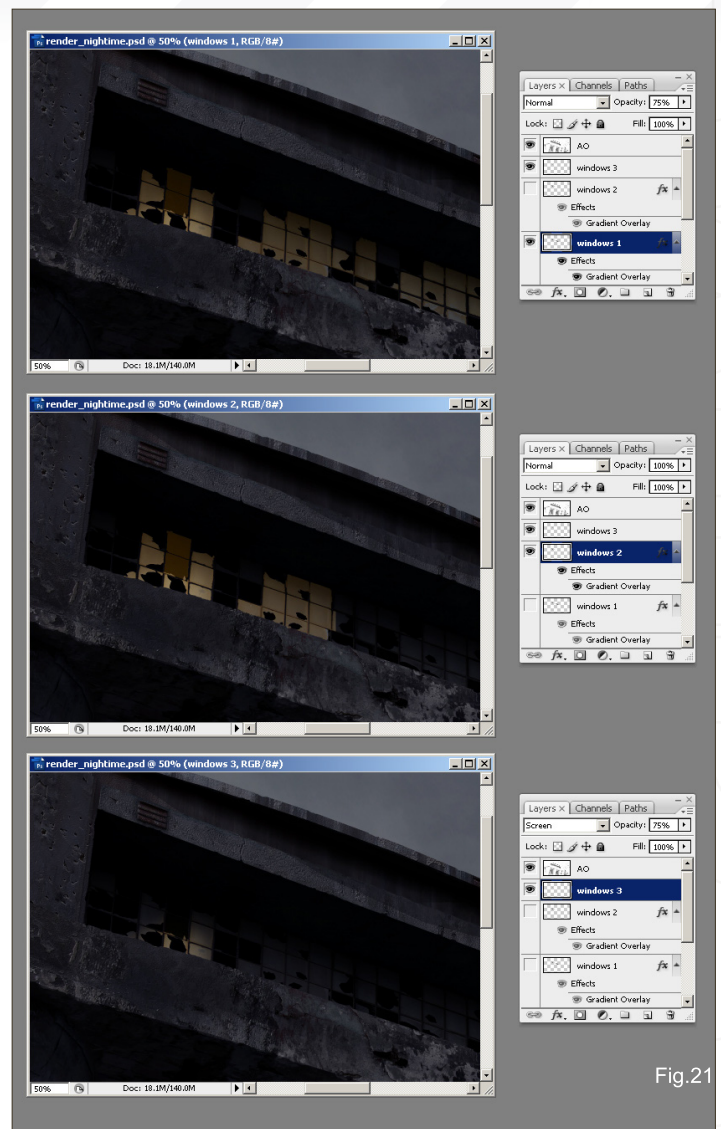
Fig.21

this tutorial I would like to mention two more that are often useful with regards to 3D renders, the first of which is Outer Glow.

Sometimes you may have a strong light source in your image, such as a lamp or bulb, or even a bright light filtering in through a window, such as in the last chapter of this tutorial series. These conditions benefit from a glow to help convey their intensity, and are achievable in Photoshop.

Imagine that we want to place a bulkhead lamp on the face of our bunker. We would probably model it in 3D and assign a self-illuminated material to it to represent the actual light. For the purposes of this tutorial I have painted a simple version onto the render to represent our 3D version, as seen in **Fig.24**.

We would then normally make a duplicate copy in Photoshop of just the 3D lamp, upon which we would apply our Outer Glow; however, in this case it already exists on a separate layer as a 2D version. I go to Layer > Layer Styles > Outer Glow and apply the settings shown in **Fig.25** to

Fig.22

Fig.23

create the full extent of the glow. Most of the settings are self explanatory and you will best understand their functions by experimenting with them. At the top you can control the Blend Mode, Opacity and color of the glow, and under Elements you have access to the size and extent of the glow, as well as how precisely it traces the source element. These are the main areas you will use but you can also alter the shape and intensity of the glow by altering and Range, and even add a pattern by adjusting the Contour.

I now select just a portion of the white area of the light and copy this into a new layer, and once again apply an Outer Glow, except this time I apply different settings to create the glow immediately around the lamp (**Fig.26**).

When we look at our Layers palette we can see the new structure and the effect of each glow (**Fig.27**).

If you wish, you could also apply a Lens Flare once the image is flattened by going to Filter > Render > Lens Flare (**Fig.28**).

The last tool we will look at, which can be particularly useful to 3D, is Bevel and Emboss, which can be used to add surface detail to your scene that can incorporate shading effects, helping to mimic 3D much like a bump or normal map.

When you go to Layer > Layer Style > Bevel and Emboss, you will be faced with a dialogue
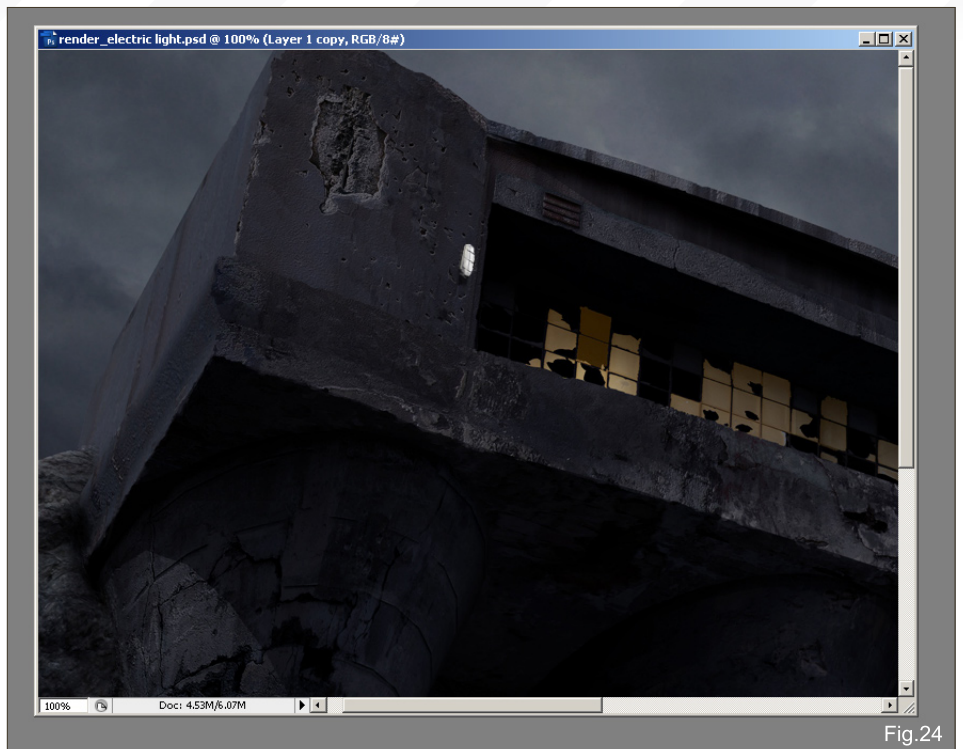
Fig.24
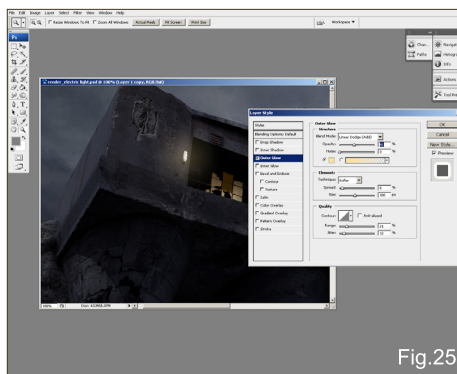
Fig.25
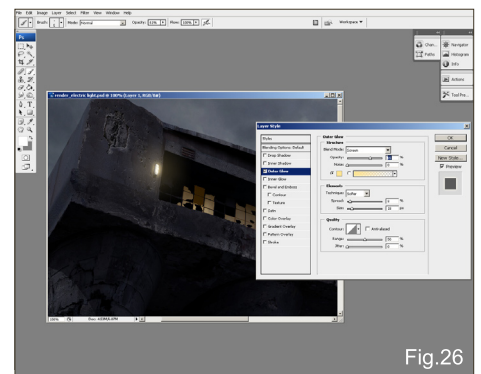
Fig.26

Fig.27

Fig.28

Fig.29

Fig.30
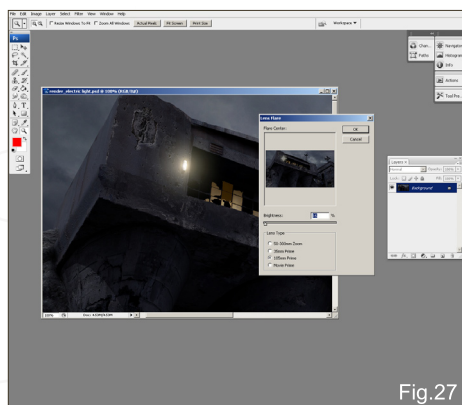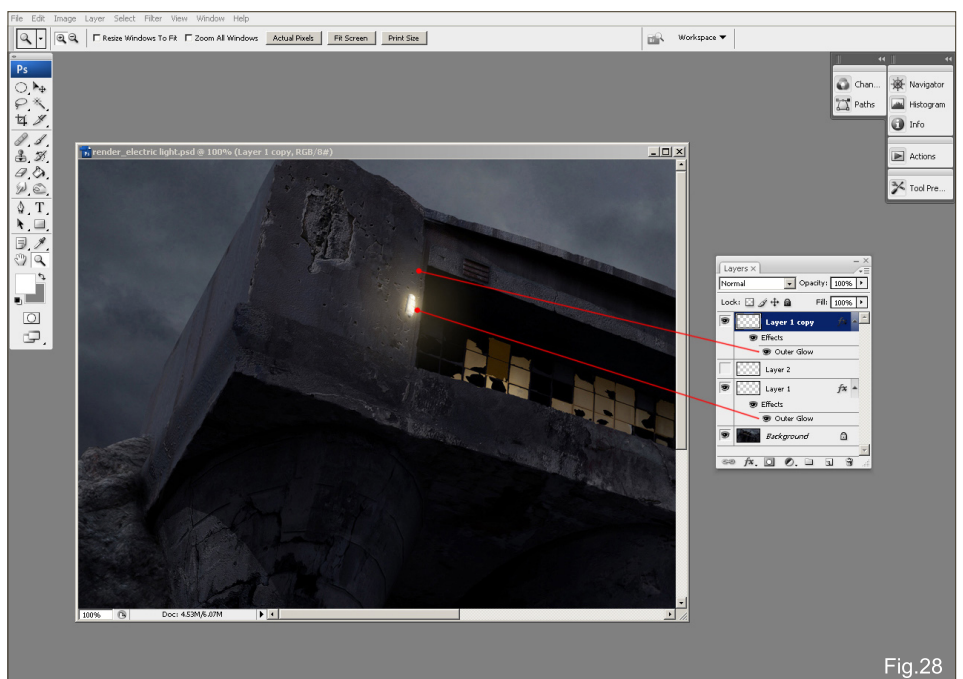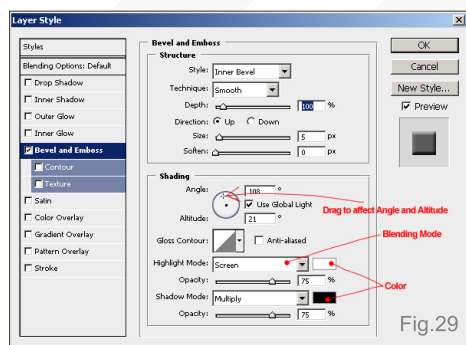
box similar to **Fig.29**. At the top you can choose the type of bevel or emboss under Style and the Technique box determines how sharply defined the edges are, effectively. Direction affects whether the layer recedes or appears to come forward, with Size and Soften affecting the scale and clarity.

In the Shading section you can drag the small crosshair to alter the direction of the light, and at the bottom you can specify the color, Opacity and blending mode of both the highlights and shadows independently. "Use Global Light" allows you to use the same lighting angle across multiple layer effects, such as drop shadow etc., but if un-ticked means the effect is local to specific Layer Styles.

To apply this effect I create a new layer and then select a brush with a neutral gray color, and start painting in some marks that will represent extra bullet and shell damage. These look almost invisible on our bunker scene, but with a white background they look like **Fig.30**.
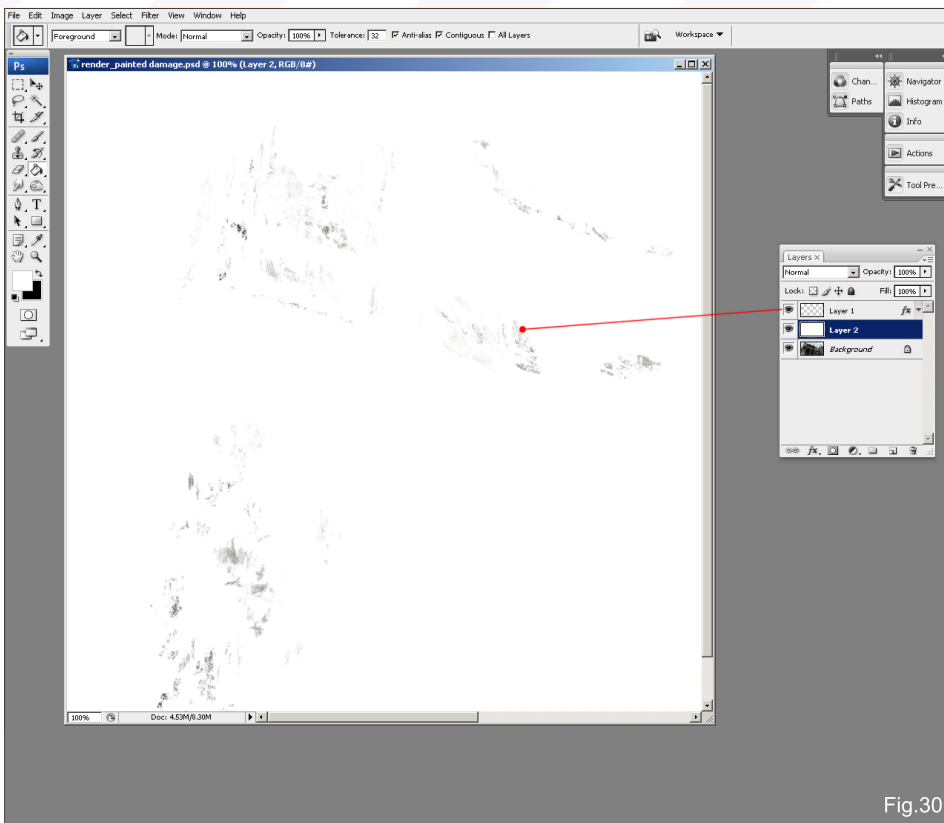
I apply the Bevel and Emboss with the following settings (**Fig.31**), and the result can be seen on the right in **Fig.32**. Selecting the right kind of brush helps when using this effect, and also enabling some of the brush settings, such as Dual Brush and Color Dynamics. You can also use the Eraser Tool to edit your marks, as well as any of the before mentioned Image Adjustments.

I also find it helpful to make a random mark to begin with and then apply the Bevel and
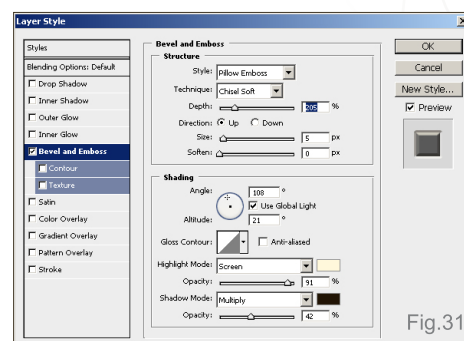
Fig.31

Emboss, after which the effect will be applied to any brush marks you add, meaning you can view the final effect as you work!

RICHARD TILBURY

For more from this artist visit
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Fig.32

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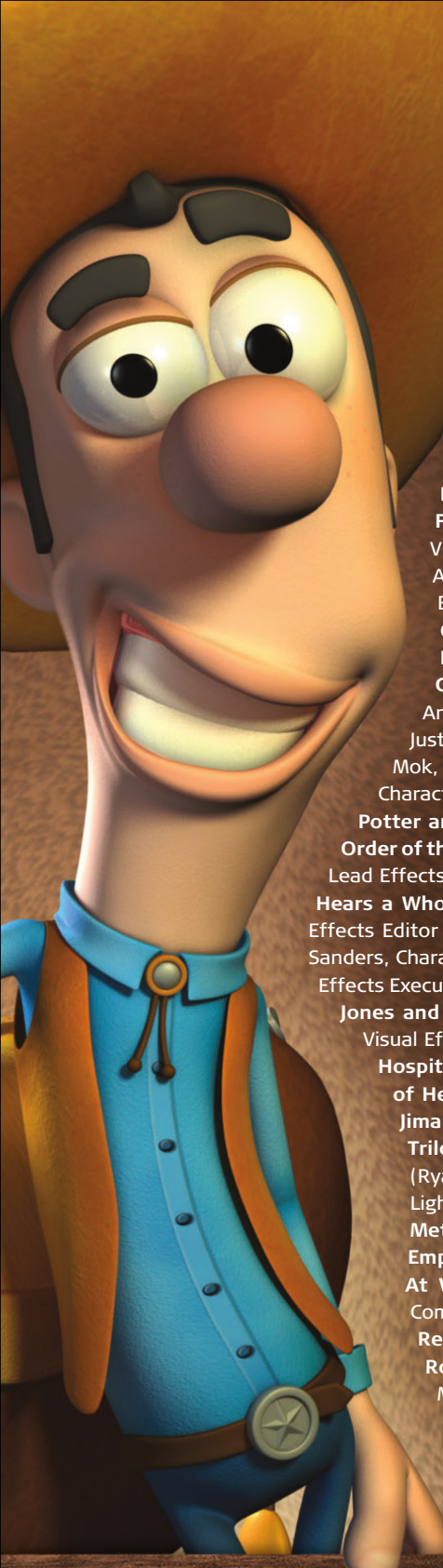
Vancouver Film School alumni credits include **Across the Universe** Geeta Basantani, Digital Compositor **Alias** Scott Dewis, Visual Effects Artist **Babel** Luis Blackaller, Storyboard Artist | Lon Molnar, Visual Effects Supervisor **Battlestar Galactica** Daniel Osaki, Lead Modeler | Megan Majewski, 3D Animator | Alec McClymont, 3D Artist **Bioshock 2 (VG)** Jacob Palmer, Animator **Bolt** Lino Di Salvo, Supervising Animator/Voice of Vinnie **Charlotte's Web** Aruna Inversin, Digital Compositor | Adam Yaniv, Character Animator | Tony Etienne, Lead Lighter | Kristin Sedore, Lighter **The Chronicles of Narnia: Prince Caspian** Andreas Hikel, Pre-Visualization Artist | Christoph Schinko, Character Animator | Jami Gigot, Senior Layout Artist **Cloverfield** Nicholas Markel, Pre-Visualization Supervisor **Constantine** Aruna Inversin, Digital Compositor **The Dark Knight** Pietro Ponti, Lead CG Lighting Artist **Dead Like Me** Daniel Osaki, Visual Effects Artist | Alec McClymont, 3D Artist **Diablo III** Alvaro Buendia, Cinematic Artist | Steven Chen, Cinematic Artist **District 9** Neill Blomkamp, Director | Shawn Walsh, Visual Effects Executive Producer | Jelmer Boskma, Modeler | Bernhard Kimbacher, Visual Effects Data Coordinator & Compositor | Julianna Kolakis, Creature Texture Painter | Adam Marisett, Visual Effects Artist | James McPhail, Visual Effects Technical Director | Dominic Cheung, Lighting Technical Director | Grant Wilson, Animator | Joey Wilson, Modeler **Family Guy** Michael Loya, Storyboard Artist **Fantastic Four: Rise of the Silver Surfer** Arun Ram-Mohan, Lighting Technical Director | Shawn Walsh, Visual Effects Executive Producer | Jessica Alcorn, Compositor **Gears of War (VG)** Scott Dossett, Animator **G.I. 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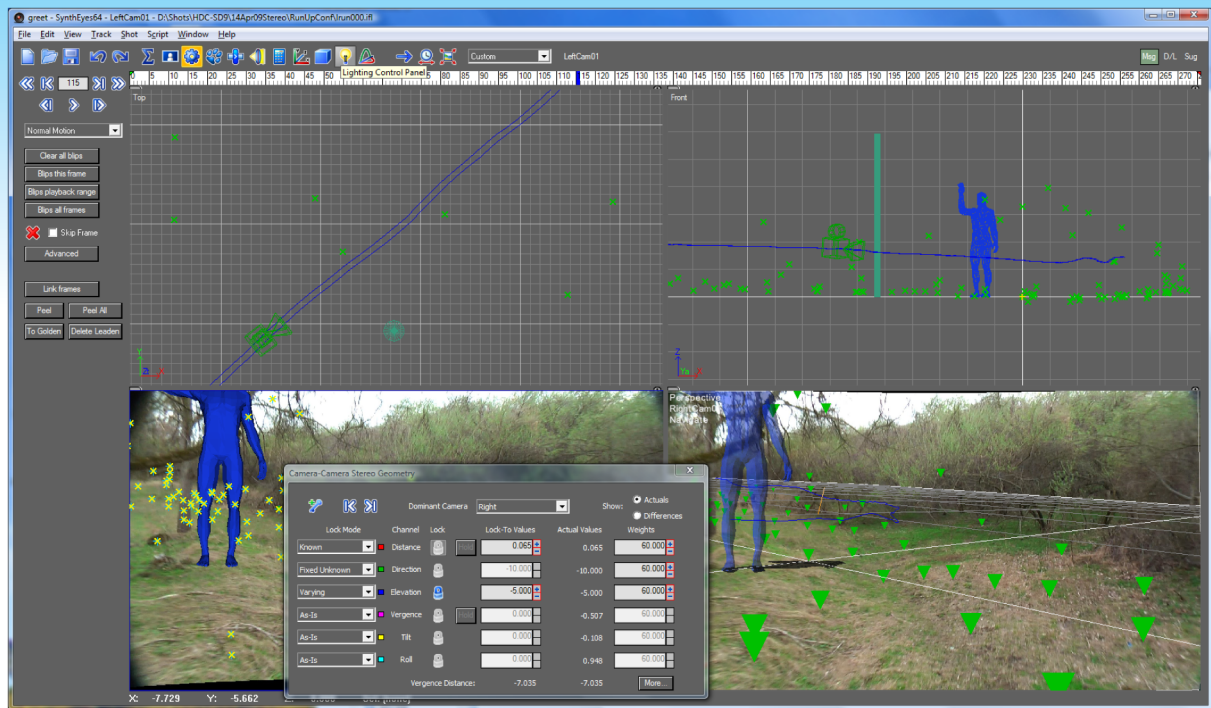**Vancouver Film School. vfs.com/animationvfx**

VFS

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VFS student work by Thiago Martins

"INNER ORGANS AND STRUCTURES WOULD BE STRESSED BY THIS MUTATION, SO I START SCULPTING SOME HYBRID ANATOMY WHERE PARTS ARE MORE HUMAN LIKE; OTHERS ARE BLENDED, WHILST SOME ARE A COMPLETE MESS – ALL THIS IS TO SHOW THAT SOMETHING WEIRD IS GOING ON RIGHT NOW, MAKING IT DIFFICULT TO FULLY UNDERSTAND WHAT THIS CREATURE ONCE WAS."

zbrush manimal

creation series: part 5 - insect-man

Welcome to the new ZBrush Manimal Creation tutorial series. Each month we'll see a new artist tackle one of our topics, who will take us step-by-step through the transformation of a generic human head and torso base mesh into a hideous amalgamation of man/creature of 3DCreative's choice! We thought that topics such as a bird, aquatic, and insect would be fantastic for detailed sculpting work – and on top of all this, the artists will texture their models, too, bringing these monstrosities to life. So stay-tuned over the next six months to see what they come up with, and to learn a thing or two about detailed sculpting and texturing in ZBrush.

This month we have invited **Federico Scarbini** to 3DCreative magazine to design, sculpt and texture a Manimal being along the lines of an "**insect-man**". And he has done us proud with this painful looking meld of a character that was once human, but is now in the process of merging into something quite hideous! Federico has done his homework, and not only has he thought about the practicalities of how such a mutation would actually work, but he has also considered the poor human's response to such a foul happening. Read on to follow Federico's process.

DOWNLOAD RESOURCES

- FREE BASE MESH

PART 5 – INSECT-MAN

Software Used: ZBrush and 3ds Max

INTRODUCTION

The idea of a hybrid mutation from human to insect was really exciting to me right from the beginning of this project. The possibilities, design-wise, are immense, and because the world of insects is so complex and varied it forced me to do lots of research before starting, since it's not a subject I have had experience with in the past.

CONCEPT

I began with some research, and obviously the first real problem to solve was how to mutate an endoskeletal being into an exoskeletal one. This was something that really worried me, and at first I was stuck at this phase for quite some time. I tried to get inspiration from sculptures by great artists, and slowly started to understand what I liked and didn't like, and what was plausible and not so. There is a fine line between what is plausible and what is "cool", and you have to be very careful where this is concerned and aim to get a good balance between the two; finding the right balance is completely up to you though, depending on your own style and artistic intentions.

First of all, I had to see if something that blends an exoskeleton with an endoskeleton could actually really exist…

Turtles have both endoskeleton and exoskeleton characteristics, but I was looking for something different: a mix of both, not coexistence. The closest thing I have found is a hydrostatic skeleton, which Wikipedia says is "a structure found in many cold-blooded organisms and soft-bodied animals consisting of a fluid-filled cavity, the coelom, surrounded by muscles".

Hmm, interesting!

Without being too rigid and technical, since I don't have the knowledge to fully understand

Fig.01

something like this, but at the same time wanting to take some inspiration from it, what I imagined was an evolution where the outer surface of the body is morphed into a net of fluid-filled cavities that hardens the outer structure. Not as rigid as a chitin based exoskeleton, but something that somehow can adapt to movement with an internal pressure system. This concept was enough to give me an idea of the look of this mutation.

So with the concept in mind, I needed to think about which human features could best mutate into insect characteristics. And so, keeping in mind the balance I mentioned before, I chose to work with human limbs, because I felt these would work best.

The facial structure is a particularly fun part to work with, because I don't want to change too much of the skull structure; I want to retain the idea that this creature was once actually a human. I'm going to focus most on the mouth, since this area is crucial in my design concept, and will be really eye-catching. The top gums and top lip will be fused into the insect's labrum; the mandible will be cut at the front to become the new "mandible", and I will add an extra structure, the maxilla, which is a newly formed part from the mutation. The tongue and bottom lip will also become the labium.

At this point I took advantage of the newly released plugin from Pixologic, PaintStop (www.pixologic.com/zbrush/features/PaintStop/), to rough out a concept to help me visualize the figure (**Fig.01**). PaintStop is really handy and easy to use, and has a lot of potential. You don't need to be a painter to use it, just draw and have fun!

LEVEL 0 BASE MESH ADAPTATION
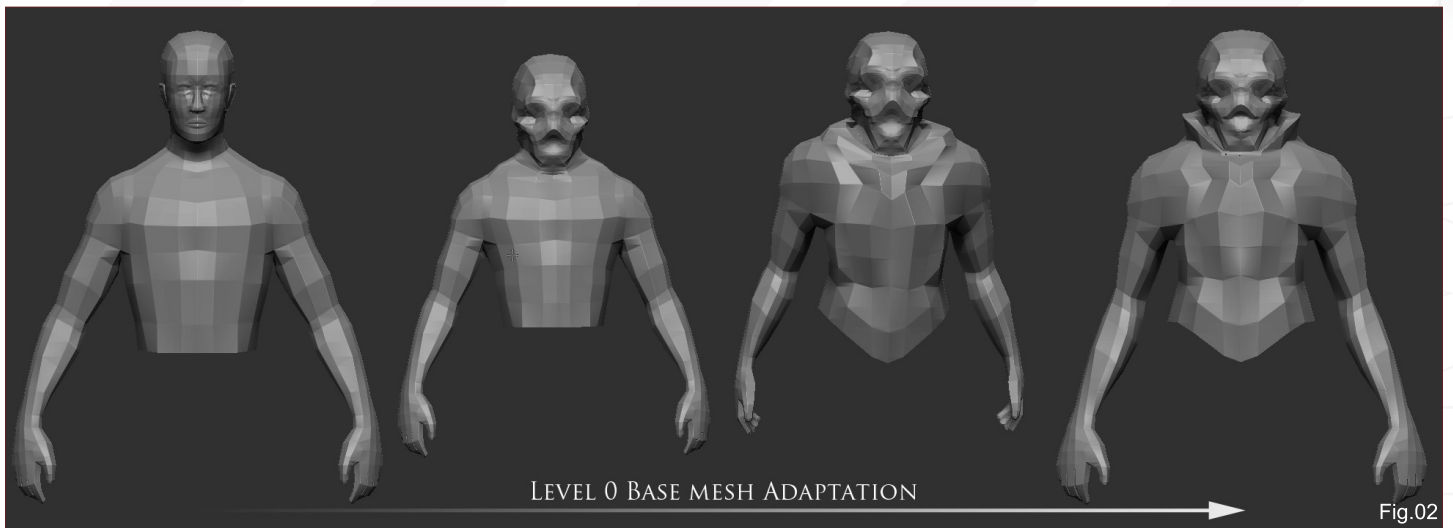
Fig.02

CONCEPT REFINEMENT

I'd like to just mention now something that happened during the sculpting process. Sometimes viewing things in 3D really shows what's working and what's not working in your design. Right in the middle of the sculpting session I realized that what I was creating was too similar to a suit, rather than a hybrid creature. This really bothered me, I didn't like it and I felt I had to find a solution to fix it. This was perhaps the hardest part of the creation process for me, because for the first time I had to face the mutation phenomena in a very different way: I started to think about what "mutation" would mean for a human being; how the character would *feel* about it. I had to think about him, and not just about the design.

So whilst sculpting, I changed my initial concept to something more repugnant, something which would make you think about what is actually going on in the image, rather than just looking at it and moving on. I introduced the human side of the creature to the concept, the portion of
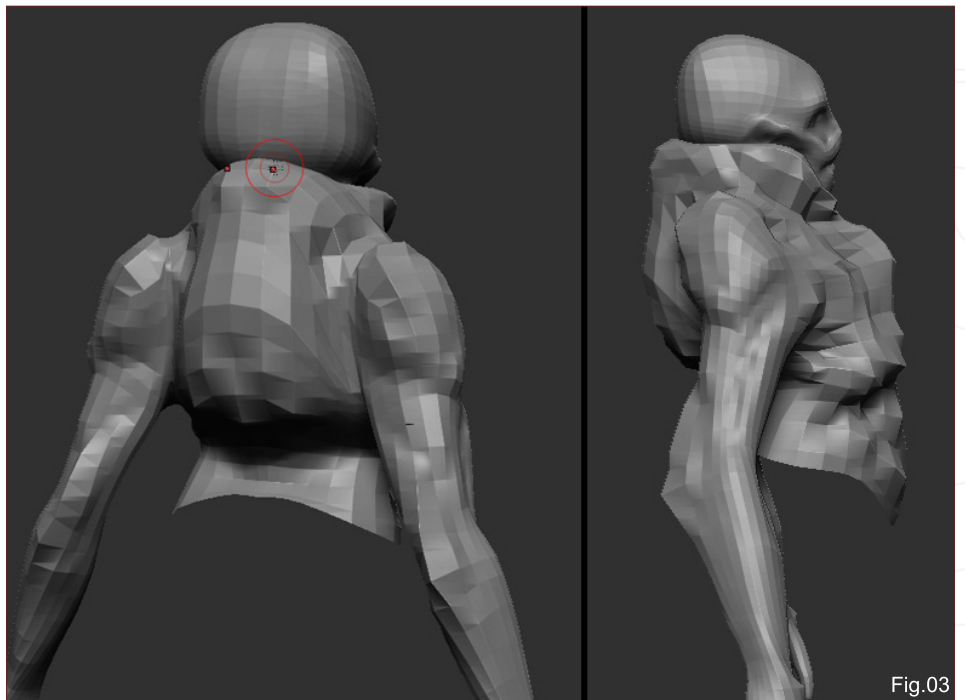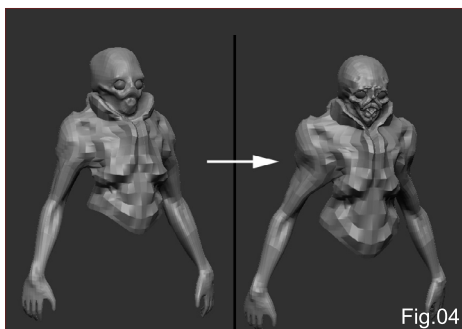
Fig.04

him that reveals his humanity, his feelings, and allows you to get a little closer to the design.

For this part of the concept I looked mainly for references concerning the molting (obviously I had to keep in mind that I was using a base mesh, so I couldn't expect to be able to do something like actually perform molting on the model; it would need to be sculpted to appear that way) and started to think about the transition between the two stages

ZBRUSH

The given base mesh was unfortunately not the easiest thing to adapt to my concept, but tricky

Fig.03

or not I had to go on and focus on doing it right. I'll now take you through my ZBrush sculpting process.

At level 0 it is really hard to find the right shapes; I push and pull vertices around to find the best positions, mainly working on proportions using the Move brush and the Transpose function (**Fig.02**).

Stepping up a subdivision level, I work with Transpose again to mask and adapt better the silhouette to my concept, and use the Standard and Inflat brushes to sculpt the main volumes (**Fig.03 – 04**).

It's really important to focus on the main forms right now, zooming out a lot to see if everything fits together, and not being afraid to make drastic changes if unsatisfied. At this stage we're working on the foundation of our sculpture; everything we will do later will be affected by the choices we make right now (i.e. in the lower subdivision levels). Later sculpting details will rely heavily on the previously sculpted surface, so basically you have to visualize in your mind the details that are not yet there, and sculpt the average version of them – a bit like a blurred image. As an example, think about painting a tree you see at 1km distance: it's nothing more than a green irregular spot. The nearer you get to the tree, the more detailed information you get to paint (describe) it.

What I also do, is use the whole range of the brushes' Draw Size, not just the big and medium ones; try to use a very small brush in the beginning as well, to emphasize some smaller details – but remember: only from the distance!

Sometimes you can focus on close-up details in your sculpting, perhaps because you need to better see just one part of the model in order to adjust everything else accordingly.

Another thing I like to do is to quickly pose some parts, like the hands or arms, in a gesture that helps me to better understand the volumes and forms.

Once I get to subdivision level 3 or 4, I started using mostly the Clay Tubes and Clay brushes, since I find myself being very comfortable
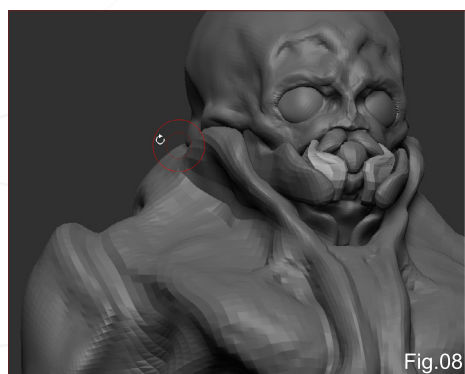
Fig.05

Fig.06

Fig.07

Fig.08
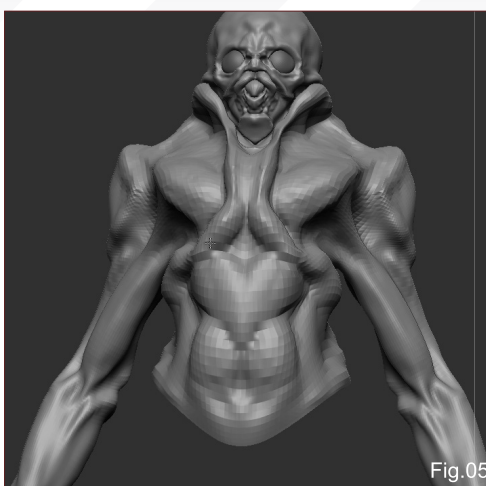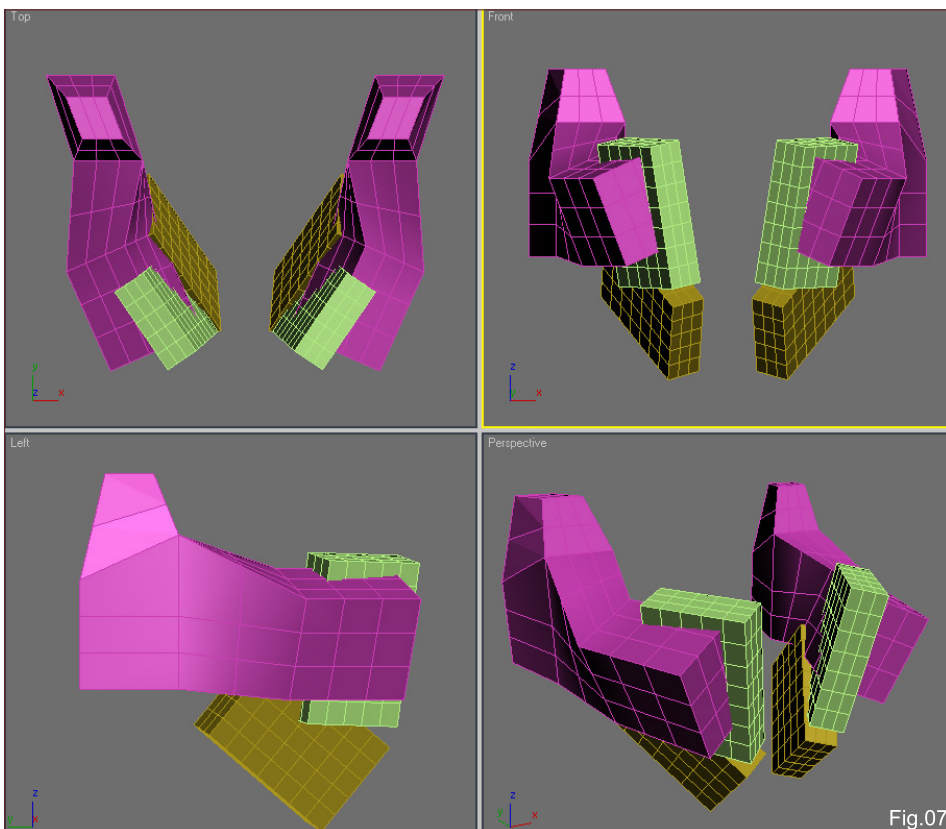
working with them; they help you to get rid of the bulginess from the lower levels, averaging out forms and consolidating the major volumes (**Fig.05 – 06**).

Additional Objects

At this stage I use 3ds Max to create some very simple geometry to use as base meshes for the mandibles and maxillae. As you can see, they are just standard cubes scaled and subdivided a few times, and just for the mandibles I've made an extrusion to better conform the shape I have in mind (**Fig.07**).

For the eyes I temporarily place some ZBrush Sphere primitives to hold the shape (I will come back to these later on).

Once I've imported the newly created .obj, I've got everything I need and I can start working on the object as a whole, trying to sculpt everything at the same level without leaving parts too roughly sculpted (**Fig.08**). This is important because you want to have a good general understanding of what is going on in the model to be able to judge what is working the way you want it, and what needs adjustments.

Moving on, I isolate the shell, and with the Clay brush I sculpt some variations into the surface (**Fig.09 – 10**).

As mentioned earlier, try to use your Draw Size range, as this will help you to to create believable variations and patterns in your sculpting work (**Fig.11**).

With the shell's main volumes roughed out, I work on the junctions in the limbs next, trying to recreate a net of underlying fibers and nerves, tendons and cartilaginous structures, and everything else that could fit to mimic what once was human and still there, but is now morphed into this new form (**Fig.12**).

Something very clear on insects is that their shells tend to have borders; in most cases they are jagged and have little spikes. To sculpt these details into my model, I use a cloud-like alpha with a Standard brush, with the Stroke set to DragDot – this is because I can get realtime feedback of both the position and the altitude of the brush, so I can very precisely place those little spikes where I want them (**Fig.13**).
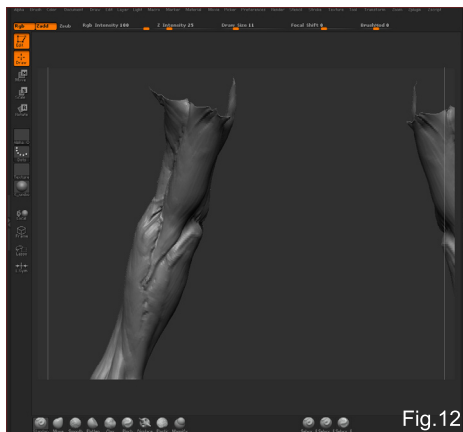
Fig.09

Fig.10

Fig.11

Fig.12

Fig.13

Adjusting the Sculpt for the New Concept
As I mentioned earlier, during the sculpting process I changed my mind, deciding to break up the insect mutation to reveal human portions to the character. Here is how:

I step back to the lowest subdivision level and smooth and reconstruct from there the human features I want to see (F**ig.14**).

I'm not afraid at all about erasing all of what I've previously done, because I am very confident about the new concept. At first the work seems massive, and it's easy to get a bit stressed because your progress is very slow, but it's very important to always remember the meaning of what you're doing: you have very good reasons to go through this process and the result will be much better than what you had previously. So, put your favorite music on the playlist and relax!

I focus on the anatomy being in the process of mutation, which is reflected in the sculpt on the other side of the face/body, so everything we know from human anatomy will be more recognizable on this side of the character, giving the appearance that the process is already taking place (**Fig.15**).

Inner organs and structures would be stressed by this mutation, so I start sculpting some hybrid anatomy where parts are more human like; others are blended, whilst some are a complete mess – all this is to show that something weird is going on right now, making it difficult to fully understand what this creature once was.

The sculpting process here is the same as done for the earlier concept, using the Clay and Clay Tubes brushes, sometimes also taking advantage of the Standard brush to apply some sharp details (veins, depressions) (**Fig.16 – 17**).

For the fine tendons you can see in the examples, I used the Clay Tubes brush to rough out the inner part of the elbow, or the "human" side of the torso, crossing strokes until I got a pattern that mimicked what I needed. Taking the Standard brush, with a really low ZIntensity and a small Draw Size, I started to slowly sculpt patterns, crossing them together and finding merging points. Looking at sculptures from Masters such as Jordu Schell, or Steve Wang, you can really understand how these patterns work and be inspired by them!

Final Sculpting Details

When most of the work is done you need to spend time working on the smaller details. Don't be in a hurry, all the steps need time and hard work, and it's really important to continue working until you feel satisfied. Every step needs the same level of attention.
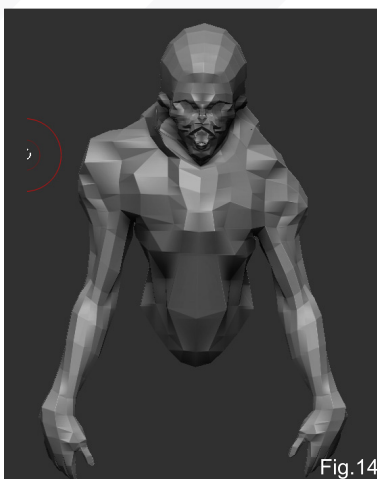
Fig.14

Fig.15
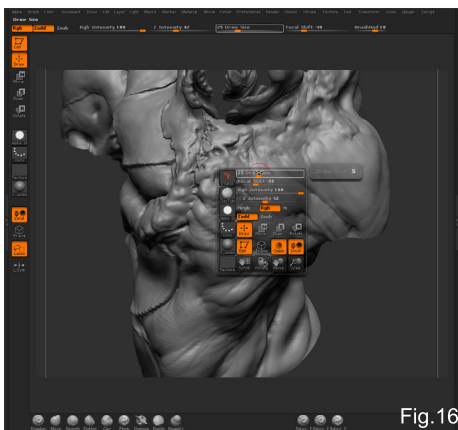
Fig.16

Fig.17

In my case, I can't really get close to the shell's appearance just with the sculpting alone, but with some fine details I can describe the surface much more and add an extra level of realism. One way to do this is to use the projection of alphas of random organic noise patterns, created freehand in Photoshop or using a section of a texture (I use the 3DTotal Texture DVDs, they have a huge amount of different surfaces to sample from), with a Standard brush

and the Stroke set to DragRect. Try to vary the scale and rotation of your projection to get a more organic and believable distribution of details. You can also use customized and more focused alphas, and place them where you need them. I used this method to simulate little cracks of plastered effects; you might want to use this method also for veins or pores (**Fig.18 – 19**). The other way is to sculpt what you need with custom alphas and use the Color Spray or
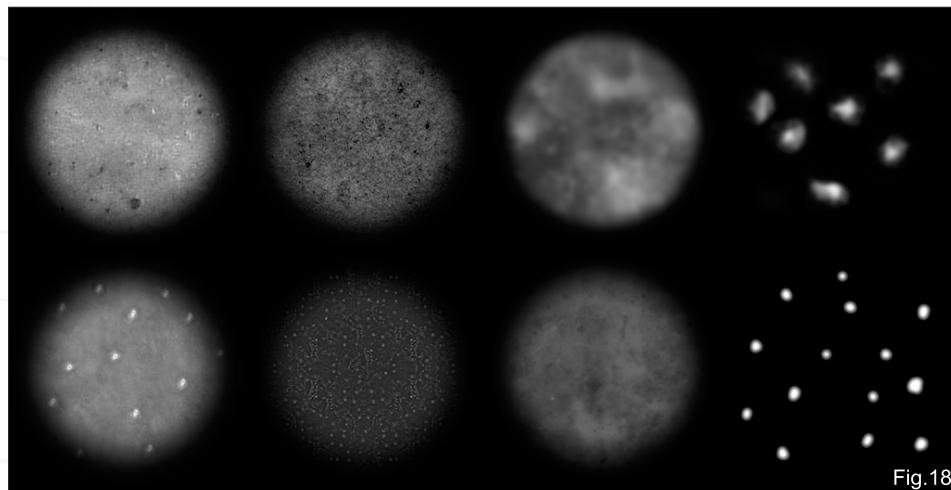
Fig.18

Fig.19
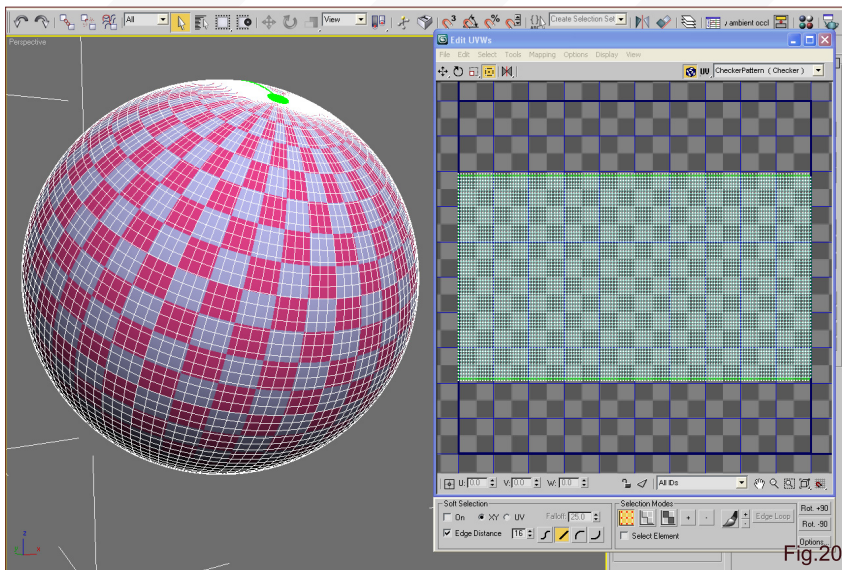
Fig.20
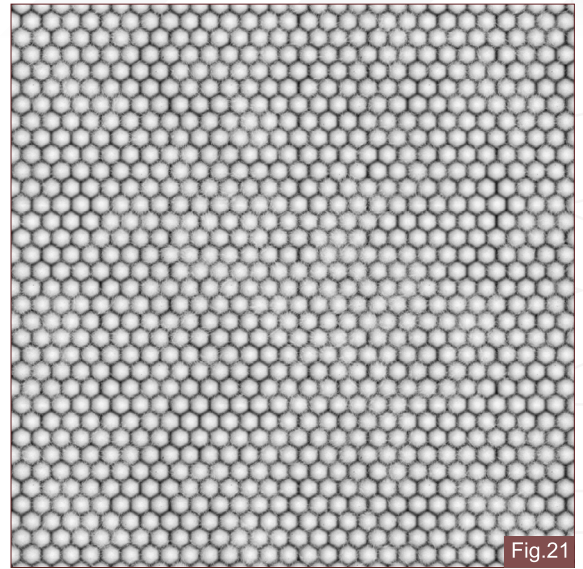
Fig.21

Spray Stroke. You can use a very small jagged circle to simulate little spikes, for example.

The insect eye was tricky to get it how I wanted it. As I mentioned previously, I used ZBrush's Sphere Primitive in the first instance as a placeholder, but I realized that the poles of the sphere tend to get jagged once subdivided and sculpted, so I needed clean geometry to work with.
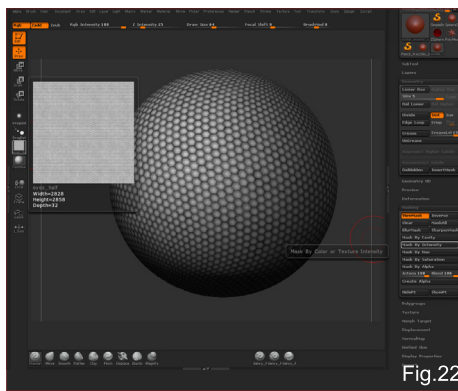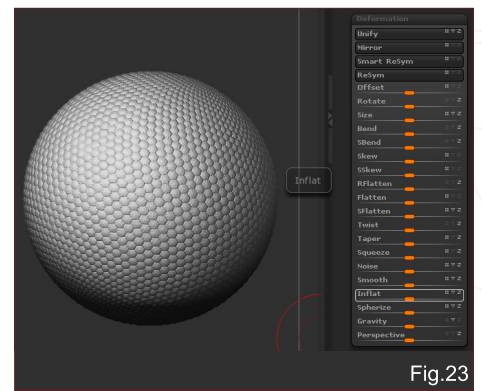
Using 3ds Max I create a simple primitive sphere with spherical UV mapping; I export the mesh as an .obj, import it into ZBrush, and position it using Transpose (**Fig.20**).

I then use Photoshop to create a beehive-like pattern that can mimic the insect's divided eye – basically a black and white image with white hexagonal cells separated by black (**Fig.21**).

Once I have the height map for the cells done, I import it into ZBrush as a texture, apply it to
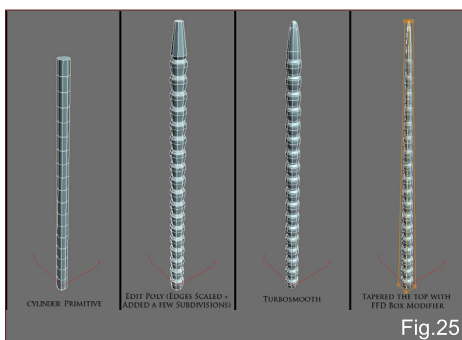
Fig.22
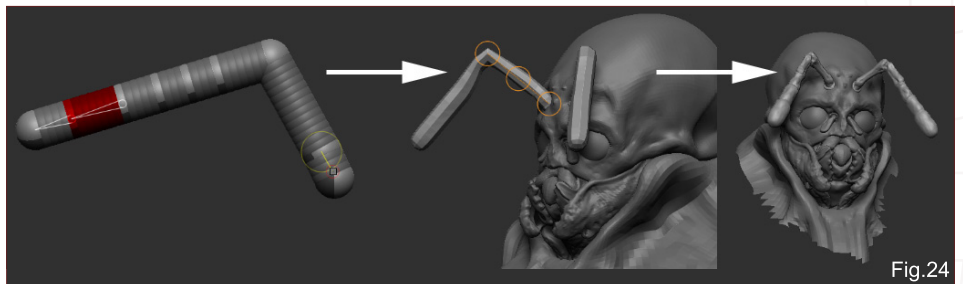
Fig.23

Fig.24

the imported sphere, and use it to mask the geometry of the eye based on the texture's intensity (**Fig.22**).

With the sphere masked, I the use the Inflat Deformation to pull out the cells and get the final divided eye (**Fig.23**).

I had a few problems with antennae. I first used ZSpheres to create a rough base mesh for them, appended them as a SubTool, and sculpted. I wasn't satisfied with this version though; the antennae were too distracting for me and I didn't like the shape too much (**Fig.24**).

So to fix the antennae problem, I create a cylinder in Max with evenly spaced subdivisions, and then, using an FFD box modifier, I proportionally scale down the top. To create the repeated bulging effect I just use the scale tool with an edge every once in a while to get the recesses I need (**Fig.25**).

In order to make the antennae curved the way I want them to, I create a Spline with the desired curvature and then deform the cylinder using a Path Deform (WSM) modifier, with the spline as the path (**Fig.26**).

CYLINDER PRIMITIVE | EDIT POLY (EDGES SCALED + ADDED A FEW SUBDIVISIONS) | TURBOSMOOTH | TAPERED THE TOP WITH FFD BOX MODIFIER
Fig.25
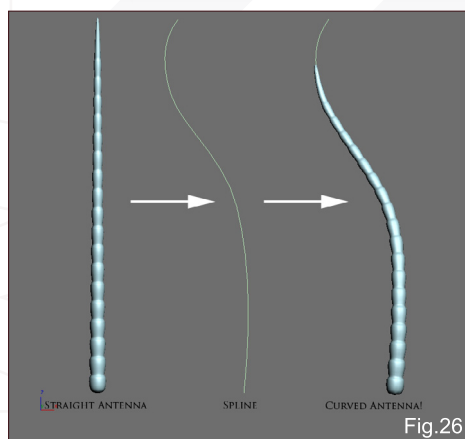
Fig.26

Once the sculpting is finished I want to pose the character using Transpose Master. Something to be aware of here is that sometimes this amazing tool doesn't work properly; I don't understand if it's something I'm doing wrong or something related to this particular model, but what happens is that when I use the tool to pose the character how I want him, and once I transfer the pose back to the subdivided mesh, I lose all my subdivision levels. My solution for this problem is to disable the UV for all my SubTools. This works just fine, and finally I have my happy ending with the results I want (**Fig.27**).

POLYPAINTING AND TEXTURING

I collect all the references I can about insects for this part of the process, as this is perhaps the most important part of texturing – it's not just about colors, but also being able to understand and recreate how nature works as closely as you can.

I've found some really very interesting color schemes in the insect world, but I also realized
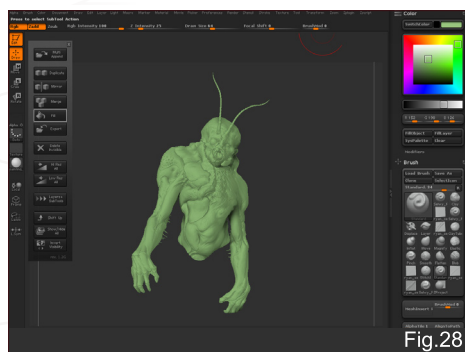
Fig.27

Fig.28
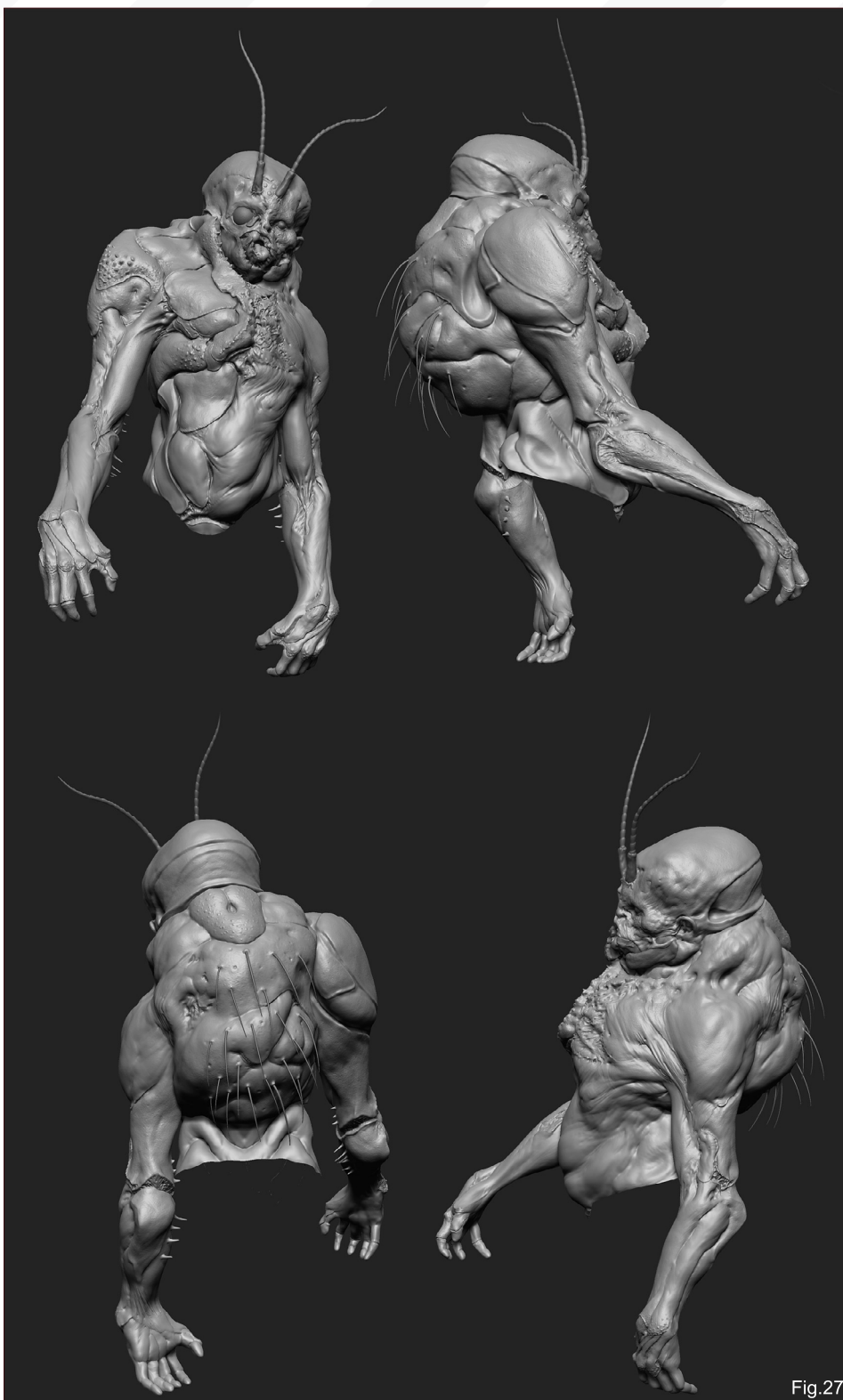
that it's very difficult to adapt bright colors to my concept, even though they are the most interesting ones. I think the main problem with this is that they look too fake when painted.

The first thing I do to begin the Polypainting process is to fill the object (remember to turn on Colorize from the Texture sub palette in the Tool menu, and have the RGB value set to 100) with a bright green color – this will be my base color for the insect half of the character (**Fig.28**).

To keep things looking interesting, I use mostly the Color Spray stroke to get some variations

Fig.29

Fig.30
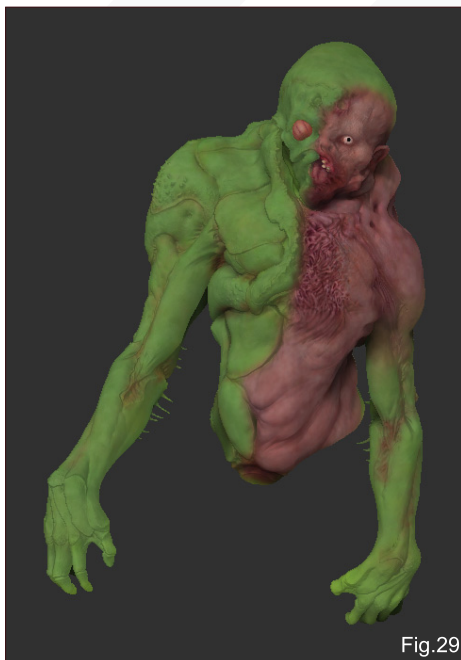
in luminosity, with different values for the Draw Size and lots of different tones of green, red and yellow. I then use the same process for the human side of the model, just using skin tones instead (**Fig.29 – 30**).

With the main variations painted, I decide to create a texture just for the body (leaving other SubTools, such as the antennae and eyes, for the Polypainting technique) for two reasons: first of all, I don't have enough polys to describe the textures; and second, I need some other tools that you can only access using the Projection Master.

So first I create an 8K white texture (this might be a bit large, but if you can handle these large files it's better to resize them down later
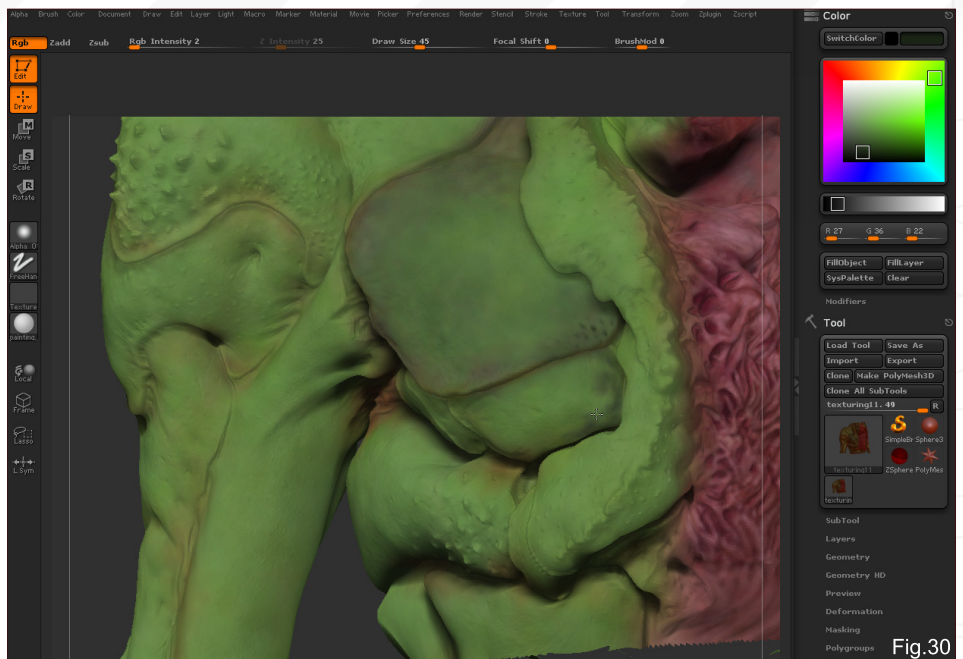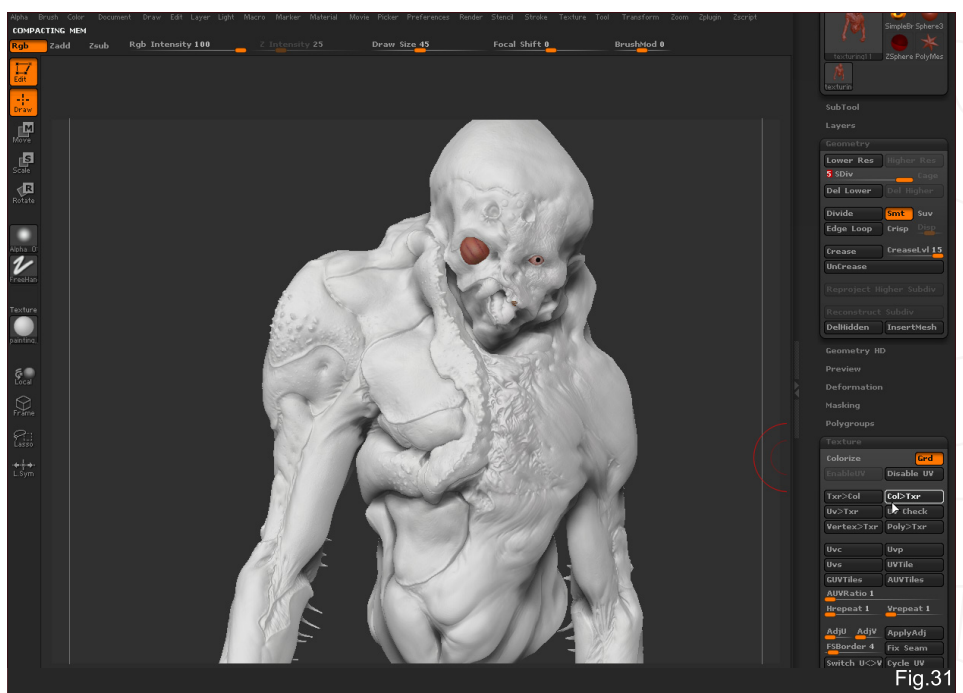
Fig.31

rather of realizing in the middle of the texturing process you don't have high enough resolution). Then, with the body SubTool selected, I turn off Colorize from the texture sub palette, go down to level zero in my geometry subdivisions, set 100 for the RGB value, apply an AUV tiles mapping, and finally hit the Col > Txr button to transfer all my polypainted data onto the texture (**Fig.31**).

So far so good!

Now I have a lot more possibilities painting wise;

Fig.32

not only using the Standard brush, but also the ability to use all the Pixol tools, such as the Sharpen, Blur, Intensity and Contrast brushes, and so on.

The first step is to enforce the depth of my texture by dimming the cavity areas and lightening the elevated ones. To do this I mostly use the Standard brush with falloff alphas like Alpha 01 or Alpha 37, to get a nice gradient between the two tonal values, also with the help of the Intensity brush (**Fig.32**).

Sometimes when you use the Intensity brush too much, you can get noisy results, but don't worry because it's easy to fix with the Blur brush in no time at all!

It's OK to use custom alphas to break down the color, using either the Spray or the DragRect stroke. And it's important not to cover your sculpted data with a generic texture, but make sure you always enforce or highlight what you had previously described in your sculpt. For example, if you have tiny spots all around the sculpted surface, make sure to paint over them with a different color to accentuate them, or if you have a crack in the surface, just enforce it by dimming the recess.

On the fleshy side I use the Standard brush with a very small Draw Size to paint in some veins, trying to change the Draw Size to get some variations in the scale, using different colors, from green to purple (**Fig.33 – 34**).

I use some cropped textures from the 3DTotal Textures DVDs (www.3dtotal.com/textures) as alphas to DragRect onto the surface to get some sharper variations; you could use dirt, concrete, organic-looking textures, or just patterns that fit with your model and concept (**Fig.35 – 36**).
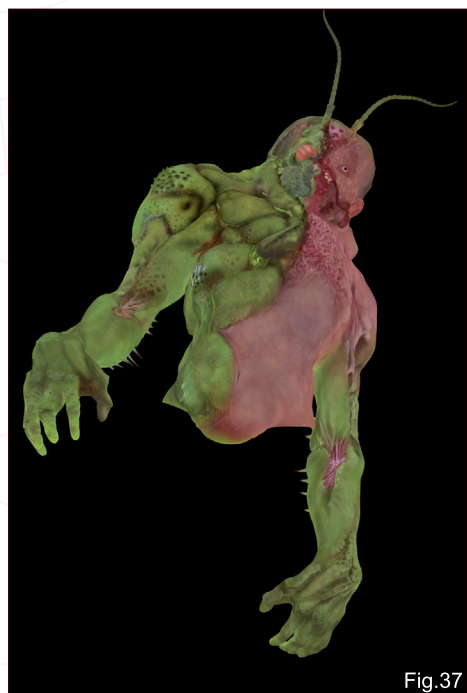
Fig.37

Fig.33

Fig.34
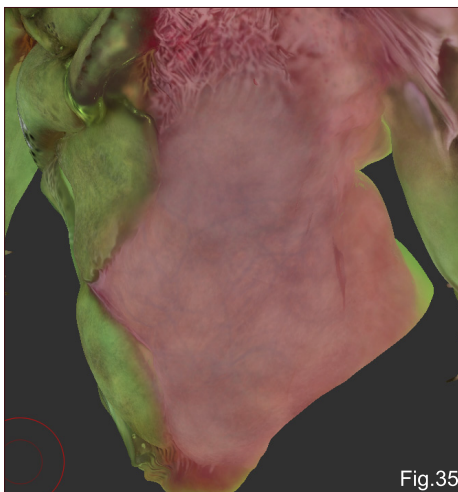
Fig.35
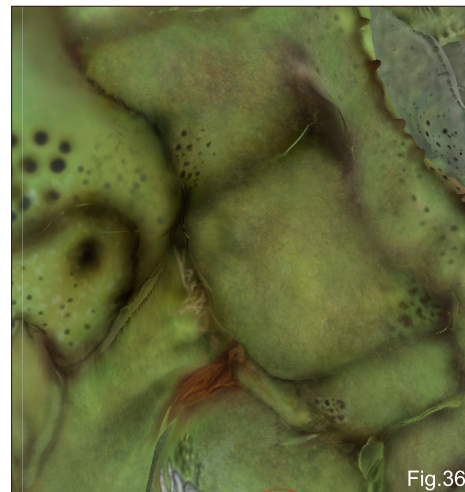
Fig.36

Also experiment with the already mentioned Pixol brushes (Intensity, Contrast etc.) with custom alphas. You can get some very nice effects with the right settings; just remember that, while in Projection Master, you're basically painting as with a traditional 2D package, so take full advantage of it!

Something to be aware of is that the RGB value tends to color a lot from the very lower settings: working with a value like 2 or 4 was enough for me for most of the painting session; the higher I got it was something like 18 on a range from 0 to 100.

You can project paint some photo references if you need them, too. There is a great video tutorial by Krishnamurti Costa (www.antropus. com/tutorials.htm) that explains this process very well. Basically, once in Projection Master, you select a ZBrush Plane as a tool with the

photo reference image you need as the texture, and a basic circle with falloff as the alpha to smooth out the corners. Make sure you have ZAdd set to 0, and simply draw your plane on the canvas. You can then use the standard sculpting tools to deform it to make it better fit your model. This is a handy way to use photos to texture your model – thanks to Krishnamurti Costa for sharing his technique with the community!

RENDERING AND COMPOSITING

We're now at the final stage of production of this Manimal.

I first of all create a pass of the texture alone, with a flat material (**Fig.37**). I then fill all the SubTools with a white color and use MatCaps to render out different passes, with and without shadows (I can then choose what I will or won't

Skin Passes

Insect Shell Passes

AO Pass

Specular Pass

Fig.38a

use). I use some human skin and insect photos to create some custom MatCaps – this process is well explained in the ZBrush Documentation you can already find online.

For the shadows and Ambient Occlusion, I use a custom-made MatCap that mimics the effect. I'm also sure to render out a ZDepth pass that

will be handy for a depth of field effect later on in Photoshop. To do this, go to the Alpha palette, press (at the very bottom) the GrabDoc button, and export it.

Other custom materials are used for the specular: I fill all the SubTools with black and use the Basic Material or the Toy Plastic

Material, and I adjust the specular curve as I need to in order to get wet-looking highlights, or glossy specular (**Fig.38a – b**).

In Photoshop you're free to experiment, adjusting the Brightness/Contrast and/or the Color Balance, using masks to differentiate the shading or even doing some paintover work if you need to. For example, I have added a bit of smoke to the bottom to better blend the character with the background (**Fig.39**).

Conclusion

This was an extraordinary project, not only because I was free to develop my own interpretation of the subject but also because I have learned so much about the insect world, as well as about sculpting and texturing. Every project needs you to find solutions to achieve the desired results, and every time it's a great challenge. What I can suggest is for you to work hard to get to where you want to be, and if you can't get there, well you'll have to work harder, defeat the problems and find solutions; think in a different way and enjoy what you're doing. This is the fundamental point to all this!

Yellow Plastic

Skin

Object Id

Falloff

ZDepth

Reflections

Ao + Shadows

Specular
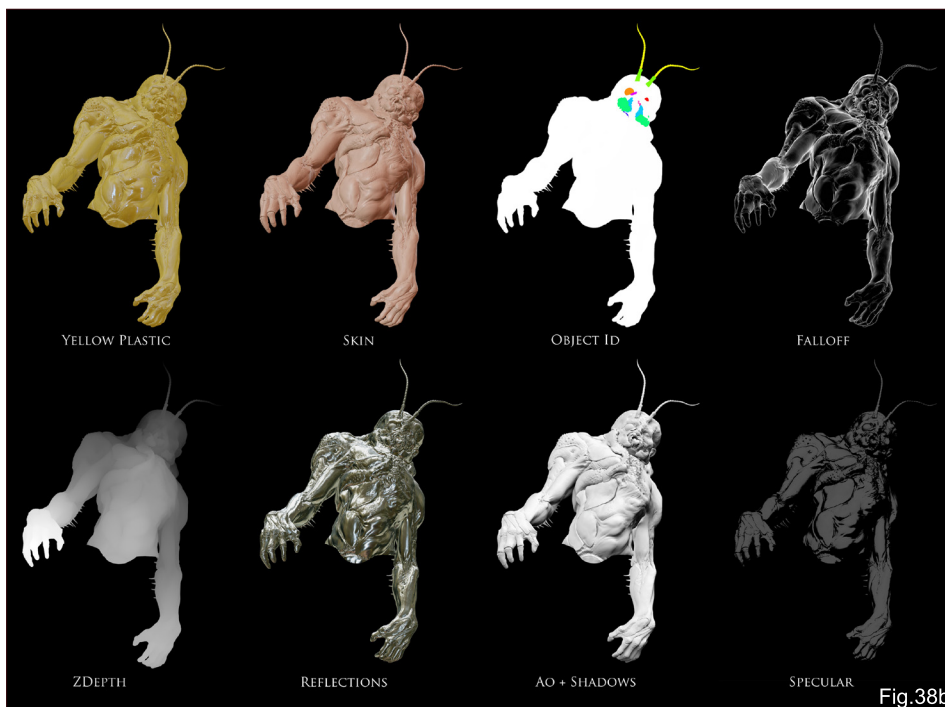
Fig.38b

I hope you have found this tutorial interesting and the techniques offered will be useful to you with your own projects. Good luck to you all, please feel free to contact me with any questions!

Federico Scarbini

For more from this artist visit

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or contact

fede@federicoscarbini.com

DOWNLOAD RESOURCES

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Fig.39

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Joe Ceballos, Art Director and Concept Artist, Whiskytree

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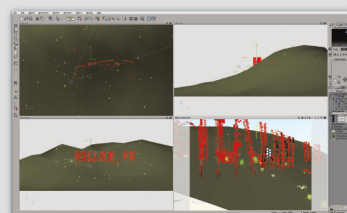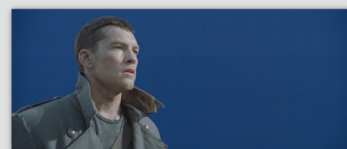
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"As with most types of artwork, whether it be 2D or 3D, the best practice is to look at the world around you and observe how things look in reality."

This series of three tutorials will take as its starting point a simple 3D scene with a limited number of objects and a low to intermediate amount of geometry and show how from a library of photos, custom textures can be created in Photoshop. All of the reference images will be taken from 3DTotal's Total Texture collections and form the foundation of the exercise. We shall show how numerous images can be combined and fused into unique templates and be used to describe a variety of materials and create the illusion of detail and volume as opposed to using actual geometry.

Chapter 1 | Aug 09

Chapter 2 | Sep 09

Chapter 3 | Oct 09

The third and final chapter will focus on the business of aging the scene by applying dirt and grime. We shall look at the value of dirt maps and how these are used directly on textures, as well as acting as masks.

CHAPTER 3

Software Used: Photoshop

In this last chapter we will go on to complete the texturing of our scene and have a look at adding dirt and grime.

First of all we will finish the barrel as this is one of the key focal points. We have already given the wood and metal an aged quality, but we can now start to add a small number of details that will give it character add authenticity.

BARREL STAINS

I am going to select one of the dirt maps from the Total Textures: Volume 2: R2 – Aged and Stressed DVD and paste this in as a new layer (**Fig.01**).

I invert the image (Ctrl+I) and then use Image – Adjustments – Colour balance to give the dark areas a reddish tint. Then I scale and move the image to fit the template and set it to Multiply with an opacity of 27%.

The Clone Stamp Tool can be used to modify the pattern across the barrel and a soft edged Eraser to better blend it in with the wood.

To show that the barrel has been used to store ale or liquor it needs some staining around the tap itself. This can be achieved by either painting it in using a textured brush or
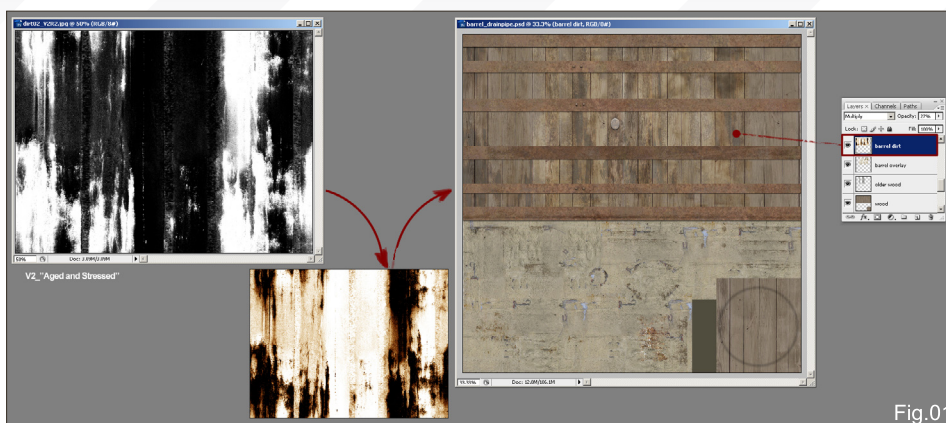
Fig.01
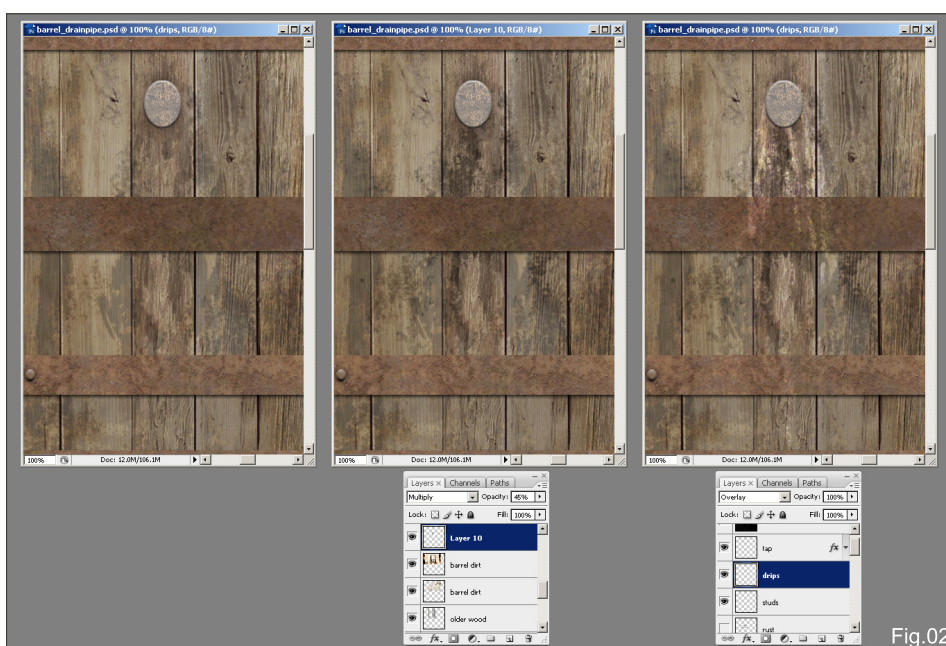
Fig.02

alternatively cloning sections from one of your dirt maps, which is what I choose to do in this case. I use two separate layers to do this; one using black and set to Multiply and one using a pale grey set to Overlay.

In **Fig.02** you can see the effects of applying these and the corresponding blending modes. I choose to have the darker stains below the metal as I am going to add some rust in this area, but the lighter drips worked better above the metal.

To add the rust I use "metal14" and "metal15" from V2: R2 – Aged and Stressed; both of which are set to differing blending modes (**Fig.03**).

As per usual these are scaled accordingly and edited to best blend in with the texture.

One last aspect to be added is the line of dirt around the base of the barrel which is done using another dirt map. We can do this by pasting in a dirt map along the base, then using
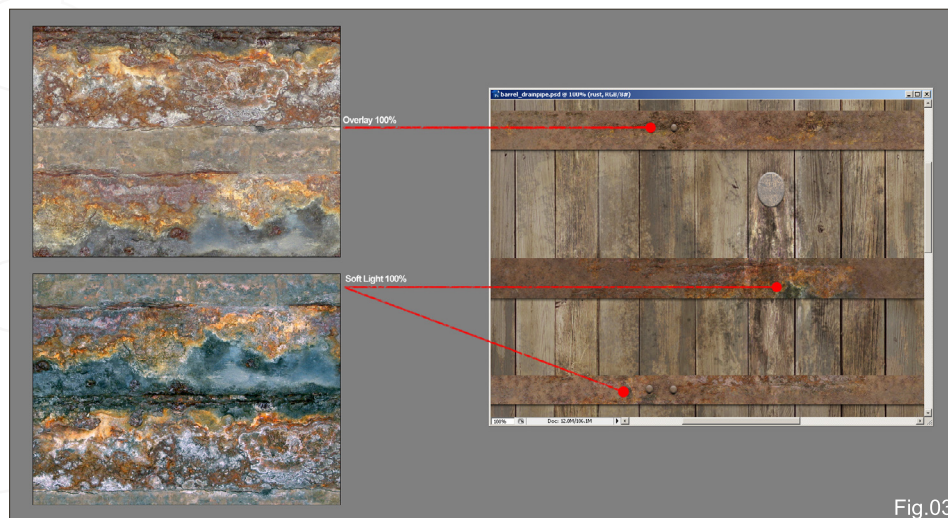
Fig.03
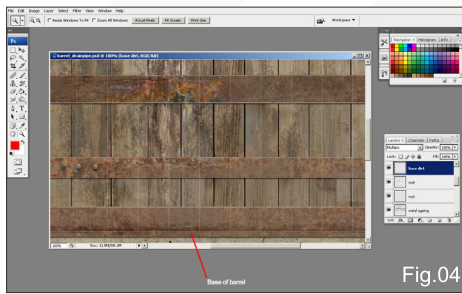
Fig.04

the Eraser to create the desired marks and setting it to Multiply at 100% (**Fig.04**).

This concludes the texturing of the actual barrel. We can see how all of these extra details helps to create a richer surface on the object compared to the end of chapter two (**Fig.05**).

DIRT MAPS AND MASKS

We can use similar techniques for the wall texture, which can be broken down into three key stages:

• Invert the map
• Colour correct it
• Set Blending Mode to Multiply and reduce opacity.

I use these three stages to create the grime that builds up under the horizontal bricks beneath the window. I choose to use "tile02heavy" from Total Textures: Volume 5: R2 – Dirt and Graffiti DVD, which has a wide aspect and suits the area in question. I flip it vertically, inverted it and then colour corrected it before setting the Bending mode and opacity (**Fig.06**).

You can follow the same steps to create staining around the base of the drainpipe (**Fig.07**).

There is an alternative method for doing this if you wish to add some extra detail into the stain or dirt itself, as opposed to having a more monochrome and "all over" look.

In **Fig.08** you can see in the top left I have found an image of stone which looks as though it could be modified to suit the context. This has been copied and then positioned into the template

Fig.05
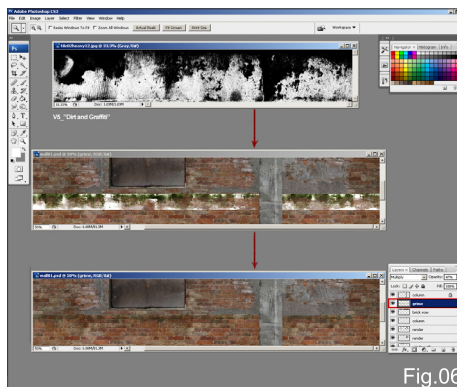
Fig.06

Fig.07

Fig.08

Fig.09

Fig.10
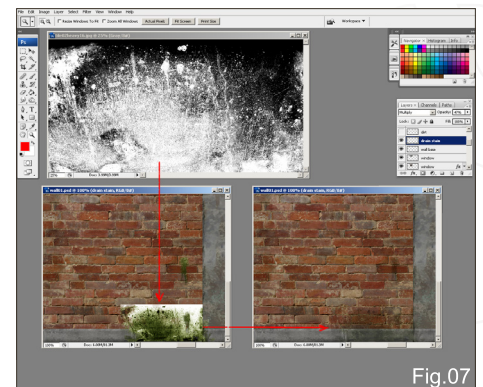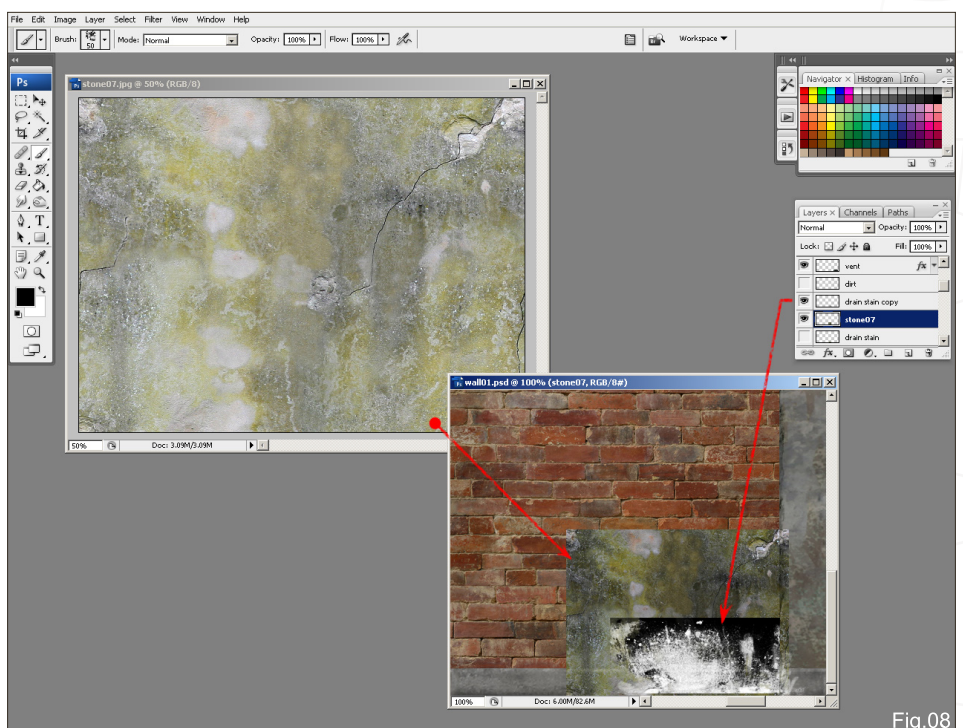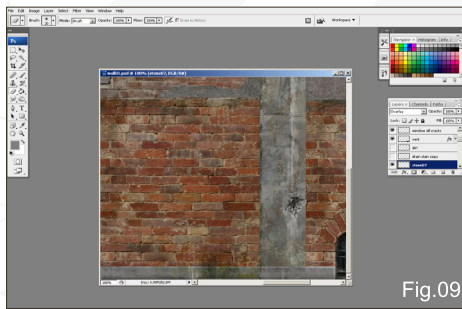
(stone07 in Layer palette) with the drain dirt map placed above it (drain stain copy).

If we now delete the black area of the map it will reveal the stone below and so once we set the blending mode to Overlay we have a different variation of our stain (**Fig.09**).

Another method of applying grime in a more liberal way, which can offer the chance of further editing later on, is by way of Layer Masks.

The first stage is to select a texture to represent your dirt or grime; in this case an overlay map from Total Textures: Volume 1: R2 – General Textures DVD (top left in **Fig.10**). It has been
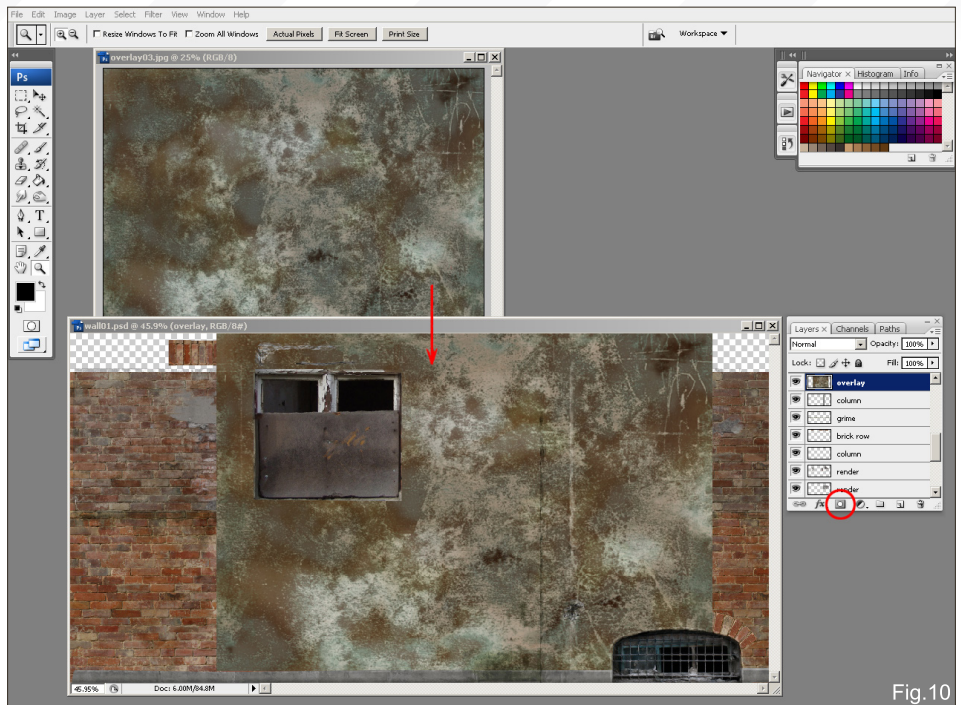
scaled down and colour corrected and is in the layer called overlay in our palette.

The next step is to add a Layer Mask (ringed in red). This will add a new thumbnail window beside the current one in the Layers palette.

By using a brush set to pure black, simply start painting out the areas that are not required (**Fig.11**). You can see here that the map has been hidden across the wall but it is evident along the column and window sill, as determined by the white "T" shape in the mask thumbnail.
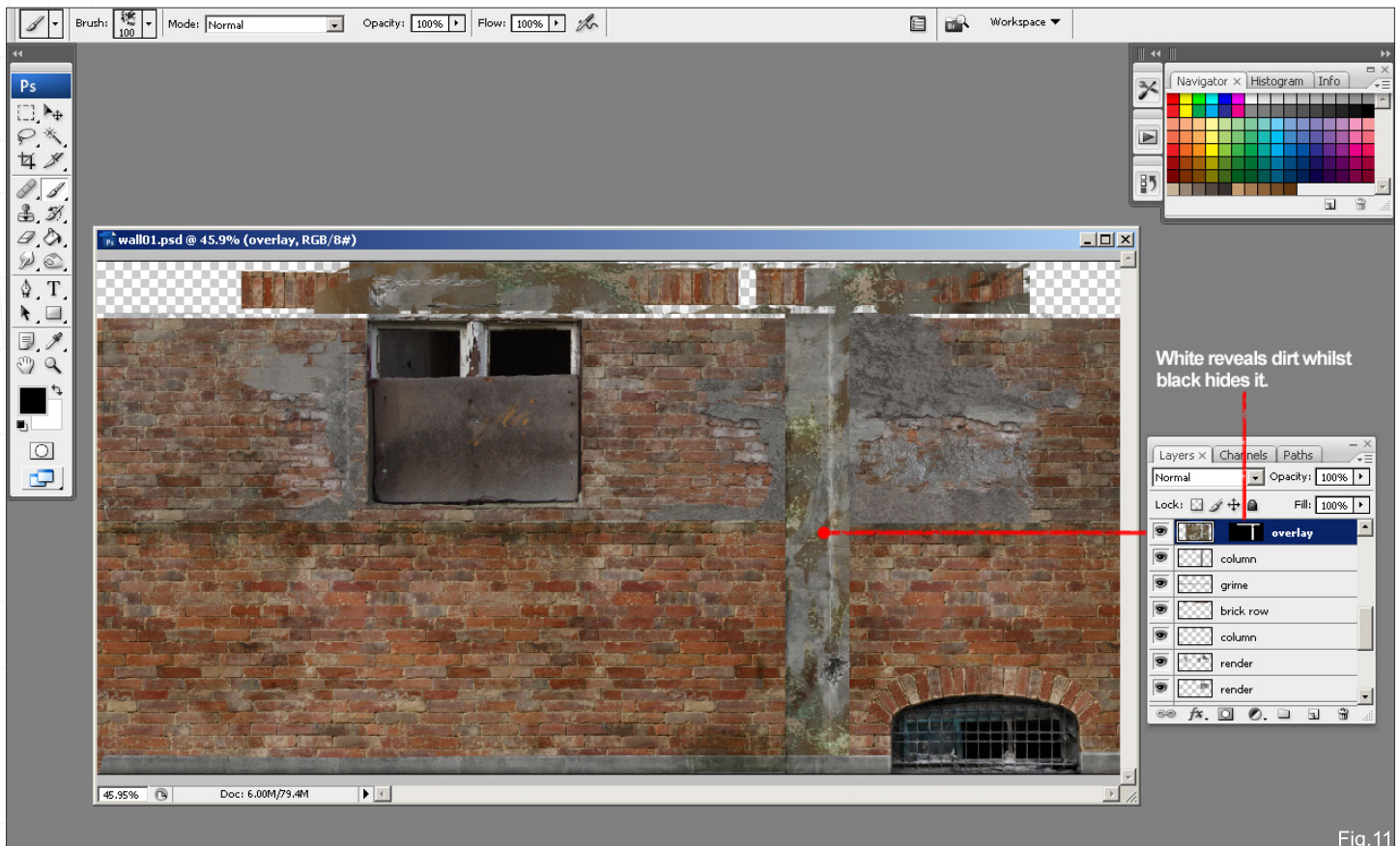
White reveals dirt whilst black hides it.
Fig.11

The great thing about this method is that you essentially have a dirt map that can cover the entire template. You can hide areas by using black or alternatively reveal them by using white. The form and pattern your grime takes depends upon your brush so a textured one with some scattering will prove useful.

Once satisfied, change the Blending mode and opacity and then if you wish to modify it in the future, just paint into the mask with either black or white – it's completely nondestructive.

In **Fig.12** you can see the wall before and after the dirt and grime has been added and the subtle differences it makes. The dirt along the column is perhaps a little too subtle so by altering the opacity slightly we can see more of a difference.

Flagstones

The flagstones are looking somewhat clean by comparison, especially around the drain, and so this will be the next area to address. The foreground is the key area as the section behind the barrel is mainly in shadow.

I select a dirt map from V5: R2 – Dirt and Graffiti, which is then positioned along the edge of the wall and set to Multiply (**Fig.13**). You can also see that I have added a soft shadow border around the drain (drain shadow) as well as using a subtle Drop Shadow.

In order to show that water has spilled beyond the drain itself, you can add the same dirt

Fig.12
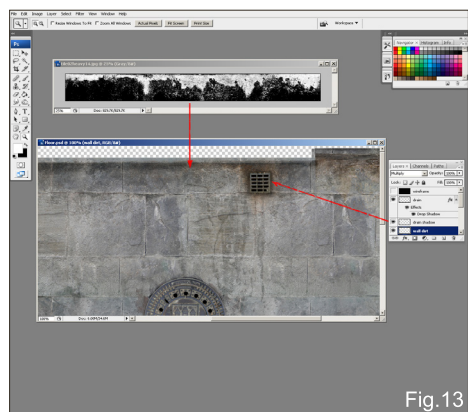
Fig.13
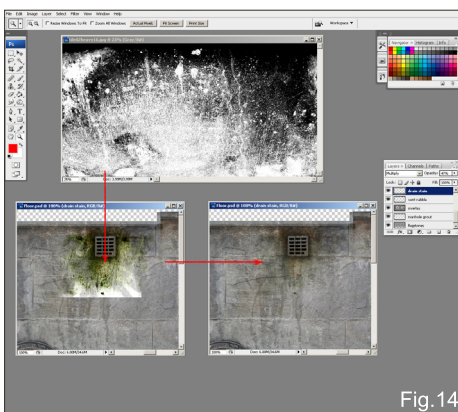
Fig.14

map that was used on the wall and then tint it green to convey a moist, algae-coated surface (**Fig.14**).

One remaining thing to do on the floor texture is to add some dirt stains around the manhole cover. For this particular section I clone sections from some of the dirt maps I have used in my template and randomly placed them around the circumference (**Fig.15**).
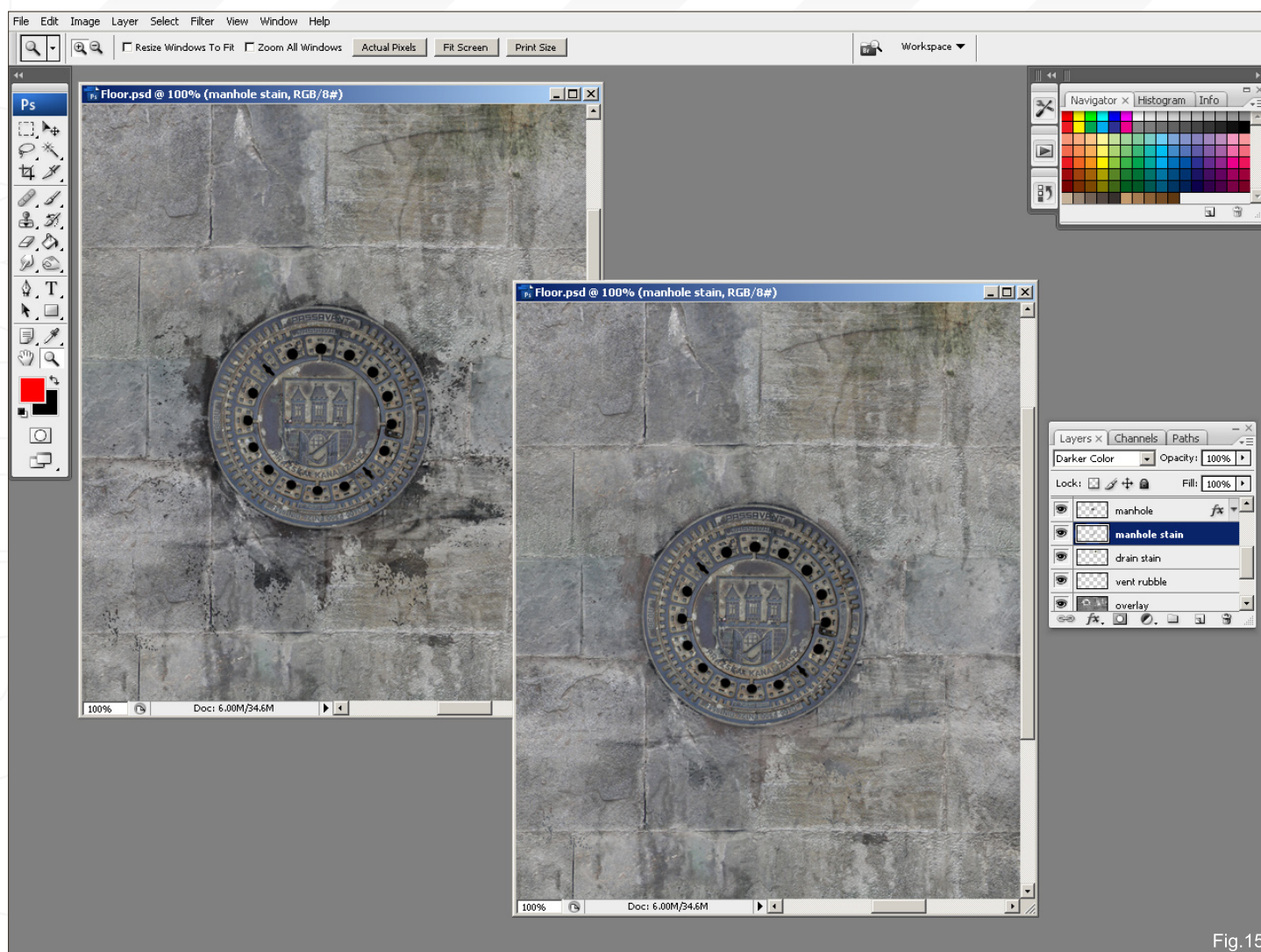
Fig.15

You can see the final version on the right set to a darker Color and on the left is the same layer set to Multiply so you can better see what it looks like.

When we render out the recent additions you can see the difference it has made (**Fig.16**). You can only see part of the dirt around the manhole cover due to the camera angle.

Perhaps the stone adjacent to the left side of the vent could have the dirt reduced as the top image adds a spatial element that is less apparent in the lower render.

This about concludes the main approaches to weathering our scene and all that is left to do is texture the wooden boards across the window along with the section around the drain. The specular and bump maps are still absent from the wall and floor but these can be created in the same way as already outlined in chapter two.

CONCLUSION

We have reached the end of this tutorial now and have seen how textures can be used to describe detail that is absent in the actual geometry. Hopefully you will have been provided

Fig.16

with a glimpse into some of the methods used to add various levels of detail to your texture templates and in turn, how these can enhance your 3D scenes.

As with most types of artwork, whether it be 2D or 3D, the best practice is to look at the world around you and observe how things look in reality. Find reference material that relates to the subject in question and it will provide much of the detail that makes the difference in your final models and scenes.

You can see the final version of the scene here (**Fig.17**).

Richard Tilbury

For more from this artist visit:
http://www.richardtilburyart.com/
Or contact:
rich@3dtotal.com

Fig.17

"THE FIRST VERSION WAS TOO EMPTY, TOO SIMPLE, BUT I SAW SOMETHING OF GOD'S LIGHT IN IT THAT I LOVED AND WANTED TO TAKE FORWARDS INTO ANOTHER PROJECT. I THINK IT'S HER FACE AND HER SPARKLING EYES THAT MADE ME WANT TO KEEP THE CHARACTER AND USE IT AGAIN."

Making of By Zoltan Miklosi
Neo-Renaissance Girl

We're always pleased to see stunning works created using freeware, so when we stumbled across this fantastic character by Zoltan Miklosi which has been modeled, textured, lit and rendered in Blender, we were keen to know more about the creation process. We hope to see more great images emerging from Blender artists into the future – stay tuned to 3DCreative as there are Blender tutorials on the horizon!

MAKING OF NEO-RENAISSANCE GIRL

Software Used: Blender and Photoshop

INTRODUCTION

Before I started working on this image I studied thousands of fashion photos to get the right pose and lighting for my character. I also looked at some Renaissance paintings to better understand the fashion of that era – this information was particularly important for the character's hat.

My original idea was to create a kind of vintage, classic, painterly portrait. I tried to apply a classic painterly effect to the whole image, to enhance the fine art feel, through the post-production work done in Photoshop; lighting adjustments, color correction, and the addition of some objects, such as the choker with a cross and the earrings.

I created the original character a while ago (**Fig.01**). I decided to use her again for this new concept, improving on the original by changing her clothing, hairstyle, and giving her a hat. The first version was too empty, too simple, but I saw something of God's light in it that I loved and wanted to take forwards into another project. I think it's her face and her sparkling eyes that made me want to keep the character and use it again.

Fig.01

Fig.02

As you can see from the final image I haven't used too many colors or different materials for her clothes – there were just four materials used to clothe her (not counting the jewelry).

MODELING

I'll start things off by giving you a detailed description about the head of the character. I created the whole head in a traditional way: using two reference photos for the front and side view of a female head, modeling only half the head (and body) and mirroring it across to the other side, attaching the two halves using the Join tool in Blender. I then divided the whole model – including the body – into different parts to unwrap for the UV map (**Fig.02**).
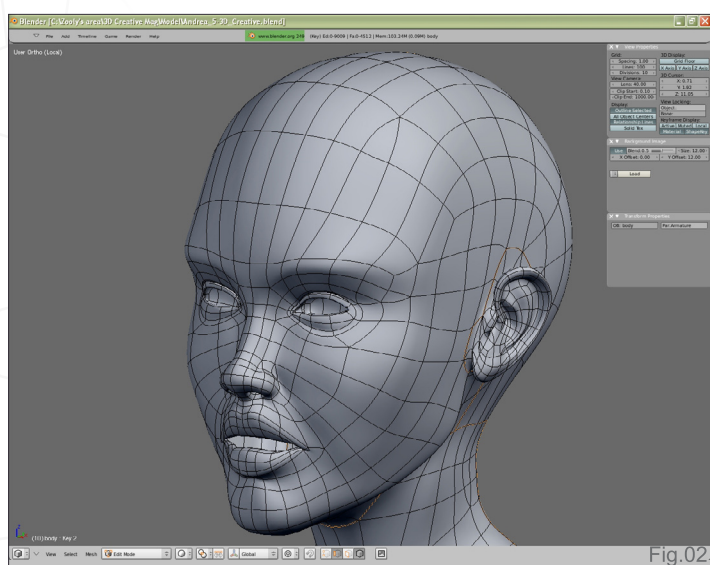
I divided the whole model into face, limbs, torso, ears, top eyelashes, eye (bottom), nails, and lips. I used different materials for different body parts; the torso, limbs, and face were given the same materials with different textures – multiple materials on each object – and the lips were just another material, just like the eyelashes, the bottom of the eye, and the nails.

Setting the skin material was actually very exciting! Basically, I used SSS (Sub-Surface Scattering) with three to four textures: color, bump and specular textures. I mixed these textures with a gradient ramp, from dark red to light red, which enhanced the flesh effect of the material. I set the gradient ramp Input setting to Result, and Method to Overlay (**Fig.03**). Most Blender artists use too much of the SSS effect, which can cause the skin material to look more like wax than skin. Another good way to achieve

Fig.03

Fig.04

Fig.05
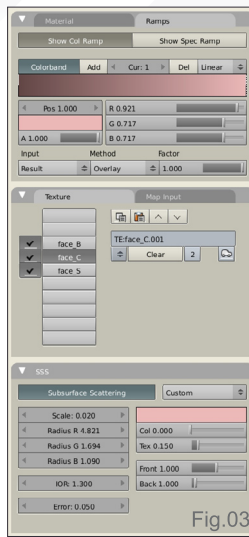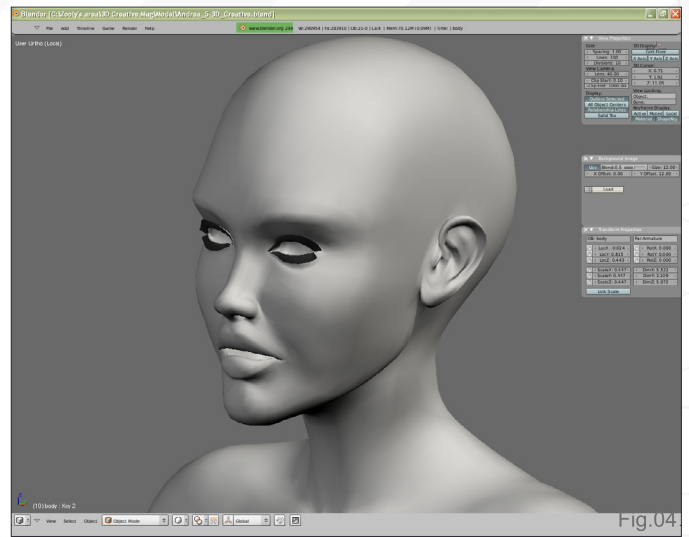
good results is by using nodes, but I personally don't like using them.

I created the eyelashes from a simple plane object containing an alpha texture. When I set the material of the eyelashes I turned off its casting and receiving shadows option, as in this case these settings weren't necessary (**Fig.04**). This technique is used with Poser characters; I believe it is worthwhile studying Poser characters as you can learn a lot from them to create your own.

"Well created, detailed clothing is half of the success of a character portrait!"

Creating eyes for a character model is one of the simplest things. Eyes are simply two modified spheres which contain one material with two properties. For this character I used a simple Z transparent material with a little reflection, and high and hard specularity for the cornea. The iris and the white of the eye were just a color texture and a bump map texture.

Clothing

Creating clothes for a character is always a huge challenge. Well created, detailed clothing is half of the success of a character portrait!

Most artists use ZBrush to create wrinkles – sometimes I do, too, but in this instance I

chose the model them. I'm not saying that my technique is excellent, but it works for me. In some cases I also add a tangent normal map texture to enhance the wrinkled effect on the materials, but not in this project.

My modeling technique for this character piece was as follows (**Fig.05**):

I modeled a simple jacket along the body's surface. I don't like to cut off body parts which will be covered with clothes and transform and use them as a coat, because it's much easier to create a new object. When you cut them off, the edges of the mesh are not always good enough to create proper wrinkles from. Most artists don't like triangular polygons in their models, but I find that there are certain cases when these polygons can enhance a wrinkled effect – they add a more realistic appearance.

I divided the coat and hat into different parts with different materials, using multiple materials on each object (**Fig.06**). I unwrapped the different parts to create the UV maps. I didn't use just one large baked/drawn texture map for the coat and hat; rather, I used small 512 by 512 pixel sized tileable color and bump textures. I set the repeats between 25 and 30 and the map's Input to UV/Flat. This way it was much easier to set the right size of the weave of the fabric. In a close-up view the weave is much more visible and clearer, so the weave needs to follow

bump map + colour map =

bump map + colour map =

bump map + colour map =

bump map + colour map =

Fig.06

the wrinkles to make the clothing much more realistic-looking.

The last step was to give a slight shine to some of the fabrics, for example on the edges. I did this with integrated textures – the Blend option – by selecting the sphere blend and setting its map Input to Reflection. This method uses reflection vectors as the coordinates of the texture.

Hair

As the first step for the hair creation process I searched the internet for a simple, not too complex hairstyle/shape which would fit in with the Renaissance age. I decided upon a mid-length straight hairstyle.

My personal opinion about creating hair in Blender is that it's not yet a well resolved

problem when compared with Cinema 4D or Maya, so for this reason I chose to use Nurbs to create the hair for my character (**Fig.07**). I hope this option will be improved in the next version of Blender. But for now, I can make hair in Blender by creating Nurbs strands around the head of the model, converting them into Mesh, and then unwrapping them for the UV map. With this character I added a color and mask textures to the strands (**Fig.08**). In other cases
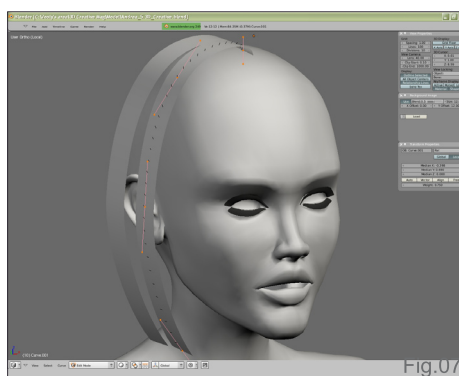
Fig.07

I would probably use Cinema 4D to create hair and convert it into Blender, but in this instance I chose the hard way.

Rigging and Posing

This is one of the best properties of Blender! There are some easy and logical ways to rig a model in Blender, but for this character I mixed the weight paint and weighting vertex group options. With the original character (**see Fig.01**)

Fig.08

"I'VE ALSO SEEN SOMETHING SIMILAR IN AN OLD SUPERMAN COMIC…"

I tried to find a pose which expressed faith/hope in a better future (which is why I titled the image, "Believer"). I wanted to use the same pose again, to convey the same sense of hope and belief in the character (**Fig.09 – 10**). I've also seen something similar in an old Superman comic, where he's stood on a skyscraper and looking out into the horizon.

LIGHTING

Lights serve to make the details visible and to give atmosphere to the image. For this portrait I used four point target spotlights, plus Ambient Occlusion. Only one light – the main light – casts shadows; I set its color to light yellow. The other lights were given medium and light blue
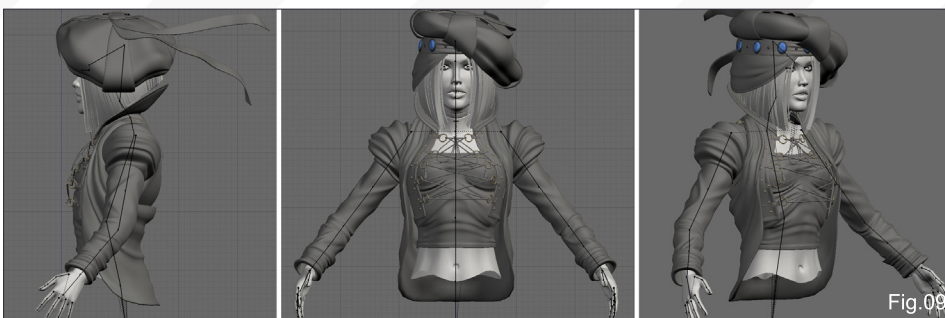
Fig.09

Fig.10
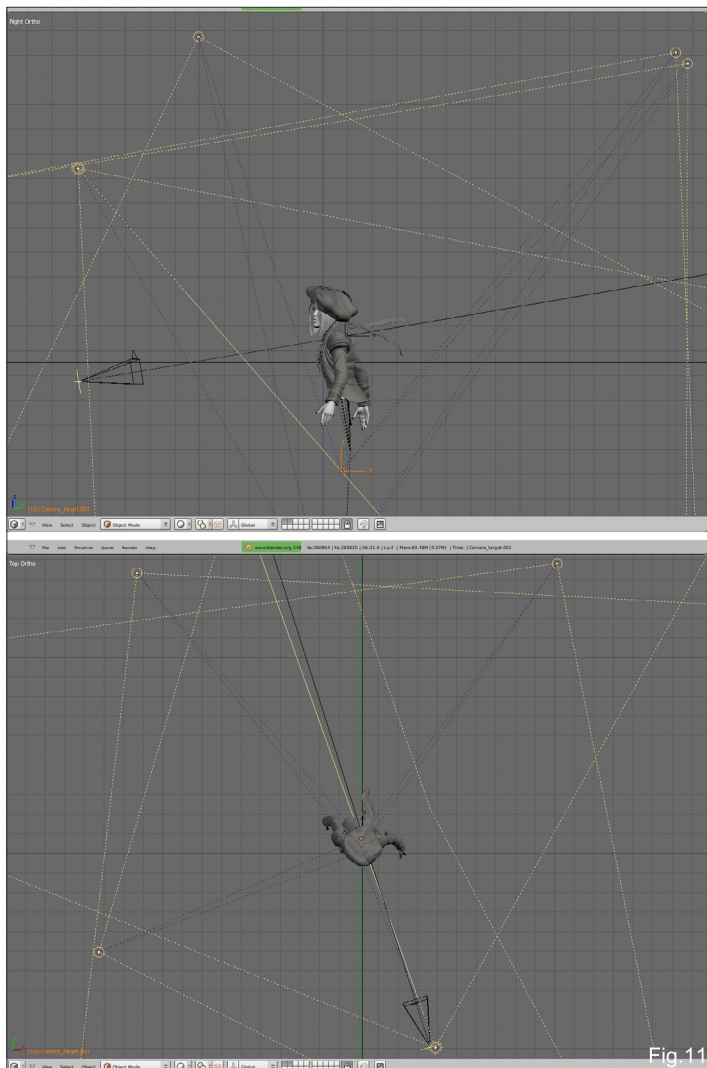
colors. For the shadow I set shadow maps to dark blue and blurred them. I find that Ambient Occlusion plus three to four lights can produce a nice, realistic effect when working in Blender (**Fig.11**).

POST-PRODUCTION

Of course, post-production work was done in Photoshop for this piece, the same as most other artists do. I rendered the character with an alpha mask so I could easily match the background behind the character in Photoshop.

The background was a premade hand painted image (by me) which was set behind the character. The last step in the post-production phase was to give homogenized lighting to the whole image. For this I used the gradient ramp option, giving the main atmosphere to the image, choosing to work with warm colors, as can be seen in the final image (**Fig.12**).

And that's about all I can write about this image. I hope you've enjoyed this insight into how Blender was used to create my Neo-Renaissance Girl. Thanks for reading!

ZOLTAN MIKLOSI

For more from this artist visit

http://visualworks.atw.hu

or contact

miklosiz@freemail.hu

Fig.11

Fig.12
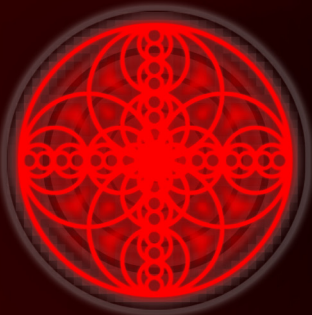
DIGITAL ART MASTERS
VOLUME 4

With the release of 3DTotal's latest book, *Digital Art Masters: Volume 4*, we have some exclusive chapters for you...

This book is more than just an artwork book. Not only does it feature full-colour, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

"Fluid X "
by Rudolf Herczog
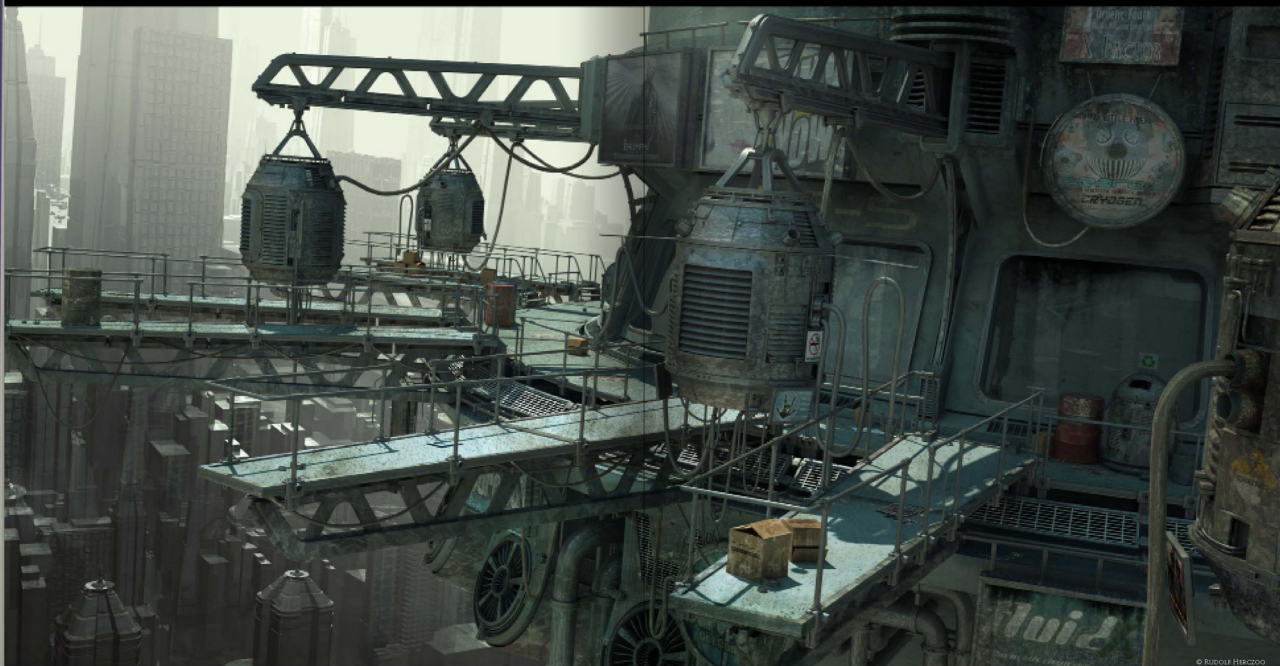
© RUDOLF HERCZOG

The following shots of the "Fluid X" book pages are featured here in full-resolution and can be read by zooming in...

FLUID X
BY RUDOLF HERCZOG

SOFTWARE USED: Cinema 4D R10.5, Maxwell Render, Bryce 5.5 and Photoshop

INTRODUCTION

The idea for this scene came from a very rough concept based on hanging fuel pumps. I have a passion for scenes that take place in a decayed future, and with this one I wanted to create a futuristic gas station – long abandoned. Normally I have a pretty good idea of what I want to create before starting with any modeling work, but in this case I pretty much came up with the scene whilst building it. I already had the idea for the pumps so I basically built the rest around that. Often a key model can be good enough to give you enough ideas for an entire scene.

MODELING

I started out with the fuel pumps. Most of my models usually start out as basic primitives, which I then add more detail to as I go. Rather than using lots of UV maps, I prefer to model as much detail as I can and then build everything from several parts, as they would have been done in real life. It may seem somewhat tedious, but the advantage is that it makes texturing that much easier.

Once I was satisfied with the design of the pump (Fig.01), I started working on the main structure. Since I was thinking of incorporating some flying cars into the scene, I wanted a platform located high up in the air as part of a tower or skyscraper. I used a simple tube object for the center and started filling up the scene by building

platforms, support beams, and fuel containers (etc.) around it; I then connected most of the objects with thick wires, pipes and bolts.

As much as I love detail work, I also like the details to have some purpose – retractable pumps, attached cables, gaps in the walkways where you park the "car" and so on (Fig.02 – 03). With the main structure done, I also modeled some props which I spread out on the walkways – not only to fill up the space but also to give the scene a messy look (Fig.04 – 05).

My initial idea was to place the scene in the center of a city surrounded by buildings and streets, but the tests I made resulted in a way too cramped scene for my tastes,

so I decided to add a large cityscape in the background instead. For this purpose, I went back to my old software Bryce 5.5. This program is capable of handling massive poly counts with ease, plus it would give me the distance haze needed, so I built up the entire background there using both Bryce and Cinema 4D-made models (Fig.06).

TEXTURING

The texturing was a fairly simple procedure. As previously mentioned, I normally model all the detail in my scenes so I didn't need to worry about creating complex maps. I could instead use tiled textures and still receive plenty of variation in the texturing if I wanted to do it that way.

I use a lot of image based materials for my scenes, and for this one I chose several metal and concrete textures from 3DTotal's Total Texture DVDs, as well as making use of a few materials specific for the Maxwell renderer. For most of the metal parts I used a galvanized material and applied some extra dirt to it using black and white dirt maps. As I wanted the construction to look really aged and weathered, I used some fairly similar materials for most of the parts (Fig.07).

POST-PRODUCTION

I used Maxwell to render out the Cinema 4D scene using the sun as the only light source, set at late afternoon, and rendered out an alpha mask at the same time to use
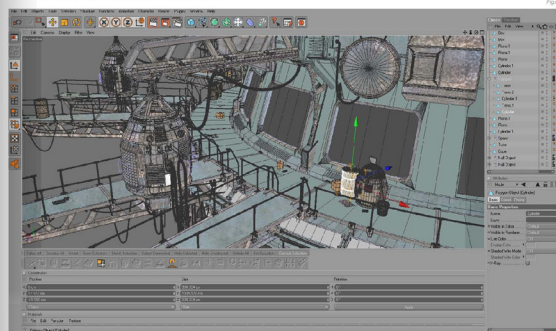
for the final stages. I also made a Bryce render of the city and matched the light source and camera as well as I could with the Cinema 4D scene. Once that was done I opened up both the Cinema 4D render and the background city in Photoshop, and used the alpha to erase the empty background of the station.

Two of the things I always like to pay extra attention to when it comes to post work on an image are dirt, and giving the scene a proper atmosphere. So first and foremost I matched up the two scenes properly and made a few billboard signs, as well as adding window reflections using parts of the cityscape. The next step was to take care of the colors and atmosphere.

I started out using some gamma correction to increase the contrast and enhance some of the shadows. I then made a few copies of each part and used the layer blending mode and opacity settings along with the Color Balance and Hue/Saturation adjustment tools to tweak the colors further. I used fewer colors on the background to keep the focus on the station, and added a slight Gaussian blur to the city, giving it the appearance of being far below the rest of the construction (**Fig.08**).

It was time to dirty up the scene! For scenes like these, I try to avoid using perfectly clean materials in order to get a base to work with. A little dirt and imperfection is good, but I wanted to keep this at a low level as I have more control in applying it with post work. I used parts of several dirt maps in different blend and opacity modes and applied them to cracks, corners and smaller details, as well as larger clean surfaces. To finish
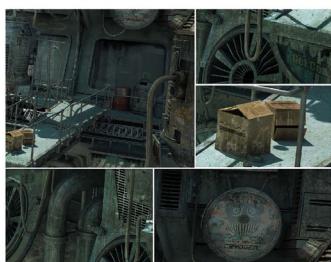
up the post-production, I baked all layers and added a little more gamma and color correction to complete the image (**Fig.09**).

Conclusion

In retrospect, there are always things you'd like to change in an image. I guess I could've spent a little more time working on the details and the coloring of the background, but still, it ended up looking way better than the initial tests and I'm quite pleased with the end result.

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ARTIST PORTFOLIO

Artist Portfolio

All Images © Rudolf Herczog
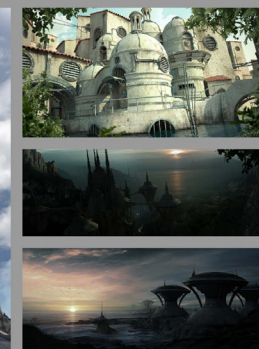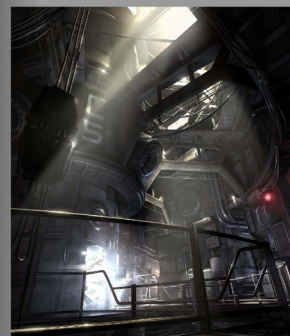
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3DC next month

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Alex Alvarez

Tutorials

ZBrush 'Manimal' Creation Series:
Part 6 - Reptilian-Man
by Tomasz Kwiecinski

**Next Gen Character
Creation Series**
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Is a resource website for the CG community; amongst our growing number of products for CG artists, we produce two monthly downloadable PDF magazines – *2DArtist* and *3DCreative*. We are based in the West Midlands, in the UK, and our intention with our magazines is to make each issue as full of great articles, images, interviews and tutorials as possible. If you would like more information on 3DTotal or our magazines, or if you have a question for one our team, please use the links below.

Contact Information

http://www.3dtotal.com
http://www.3dcreativemag.com
http://www.2dartistmag.com

Editor & Content Manager > Lynette Clee
lynette@3dtotal.com
Lead Designer > Chris Perrins
chrisp@3dtotal.com
Marketing > Jo Hargreaves
jo@3dtotal.com

Partners

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Eva Wild

Female Characters Creation

Introduction:
The 'Eva Wild Series' – Our aim in this series is to provide comprehensive lessons to produce a complete fully rigged, textured and anatomically correct female character. This series fits well into 3 DVDs with 3 separate professional 3ds Max instructors taking you through each if their specialties in very detailed step by step processes making this training suitable for artists of all levels.

Part 1 - Modelling:
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3ds max

NEXT GEN

CHARACTER
CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Chapter 4 – Mapping / Unwrapping

This part of the tutorial will focus on a vital part of the pipeline in readiness for the texturing phase, namely the mapping and unwrapping. It will provide an insight into various approaches to mapping and show how to go about exporting a wireframe template to be used as a guide in preparation for the next chapter.

DOWNLOAD RESOURCES

- Free Low Poly Mapped Base Mesh

CHAPTER 4 - MAPPING / UNWRAPPING

Software Used: 3dsmax

Welcome back to our character creation series. After the last two months' of ZBrush sculpting we are on the home straight and our finished character is within sight. This month we will be concentrating on a vital part of the process: unwrapping. Unwrapping, or UV mapping, is the process of splitting your mesh up into parts that are then flattened and arranged ready to be painted on. There are many methods to unwrap a mesh, and I'm going to show you my most widely used and recommended.

Export your lowest iteration of the model from ZBrush. Although we imported our own when we started the sculpting process, the mesh might have changed slightly, so importing our base subdivision level from ZBrush will ensure we have our latest version and will be more accurate in general. We can also further adjust the mesh to fit the high-poly now that we know which areas need modifications.

1. Let's start by chopping our model in half. We only want to un-wrap half our model, as we will create symmetry later by flipping half the character's UVs to create the other side. Go ahead and select the character's right side, making sure all the polygons in the X-axis are selected. Pay close attention to the mouth area which has the highest concentration of polygons (**Fig.01**).

2. We are going to work from the feet upwards, so select all of the polygons of the foot, calf and shin (**Fig.02**).

3. In the modifier panel, find the button labelled Detach. Leave both check boxes unchecked so the original polygons are deleted and a new model is created in their place. We will do this for every section we unwrap, since it's more efficient to work on the different sections individually.

Fig 01
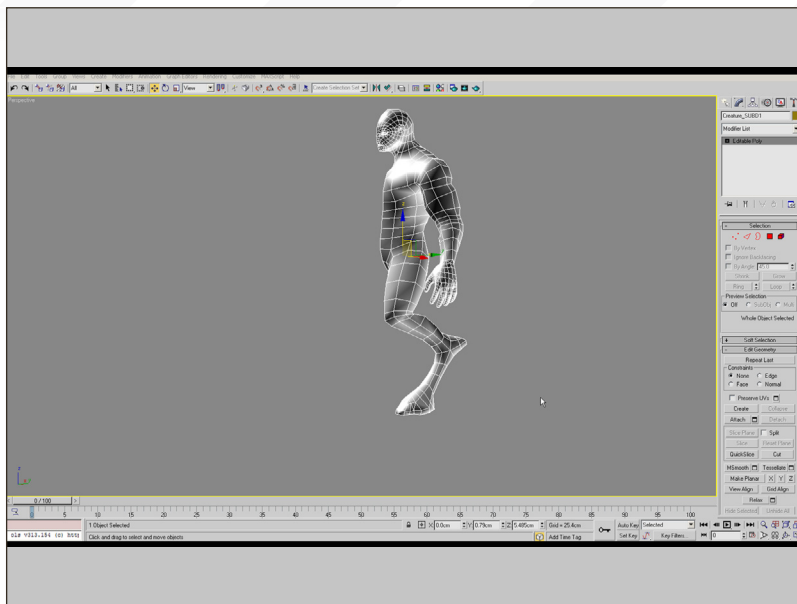
Fig 02
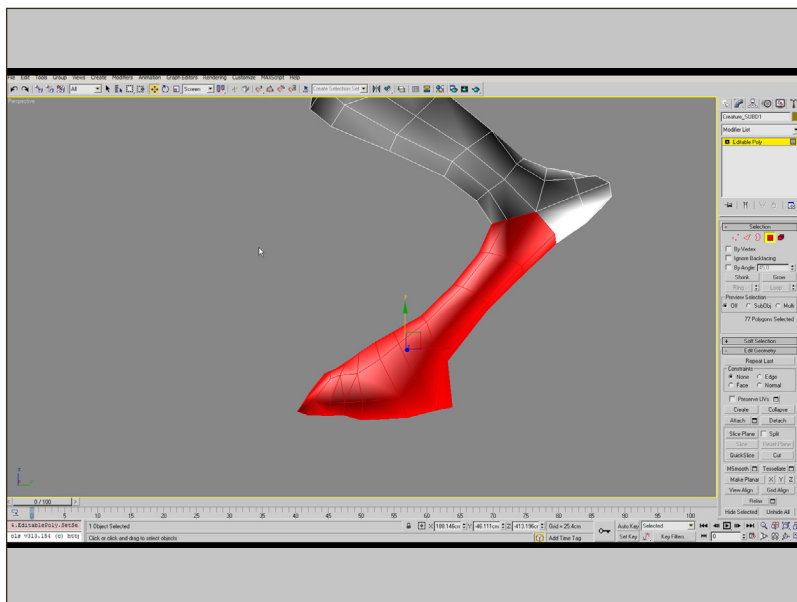
Fig 03a
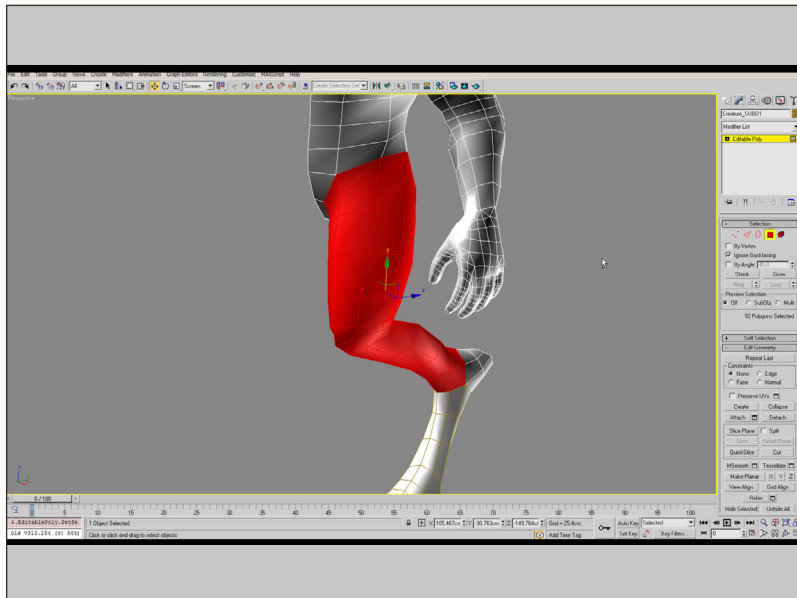
Now select the polygons of the lower and upper leg, including most of the thigh and crotch area. Make sure to select polygons in a loop around the crotch so the seam is not unnecessarily broken and will be easier to edit later. Also, do not select the polygons on the back of the lower knee joint as we will un-wrap those later (**Fig.03a – 03b**).

Fig 03b
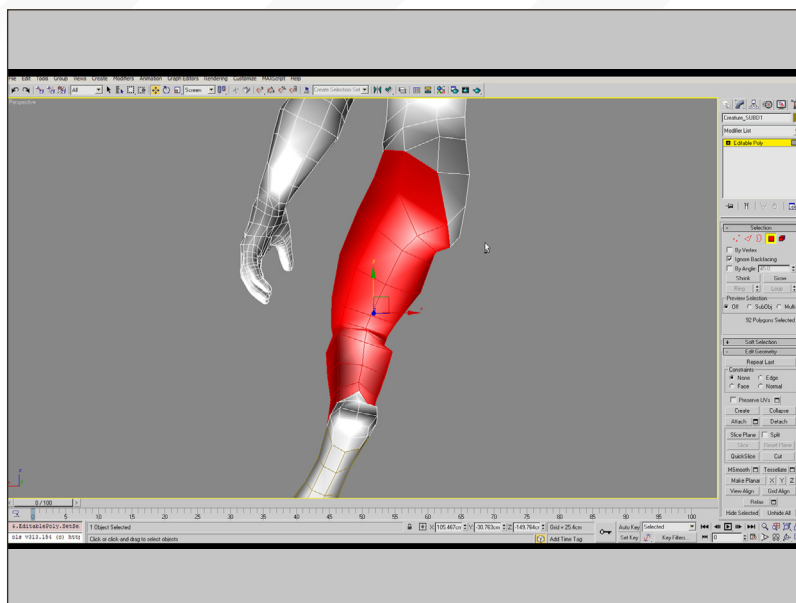
4. Detach this section again using the same techniques as before, and then move on to detaching the arm. We want to make sure we stop at the wrist and shoulders as we will un-wrap the torso and the hand separately (**Fig.04**).

Fig 04
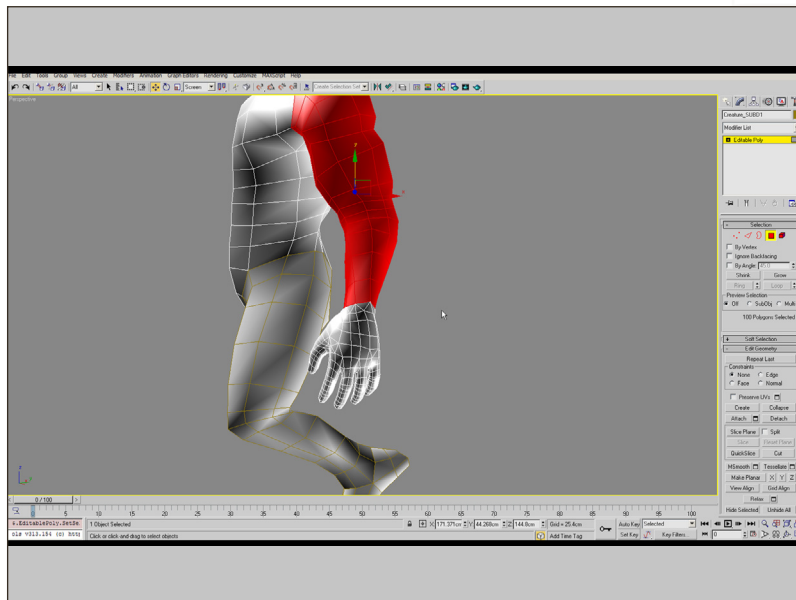
5. Select the polygons around the shoulder and the wrist in a loop, and detach the arm piece (**Fig.05**).

Fig 05
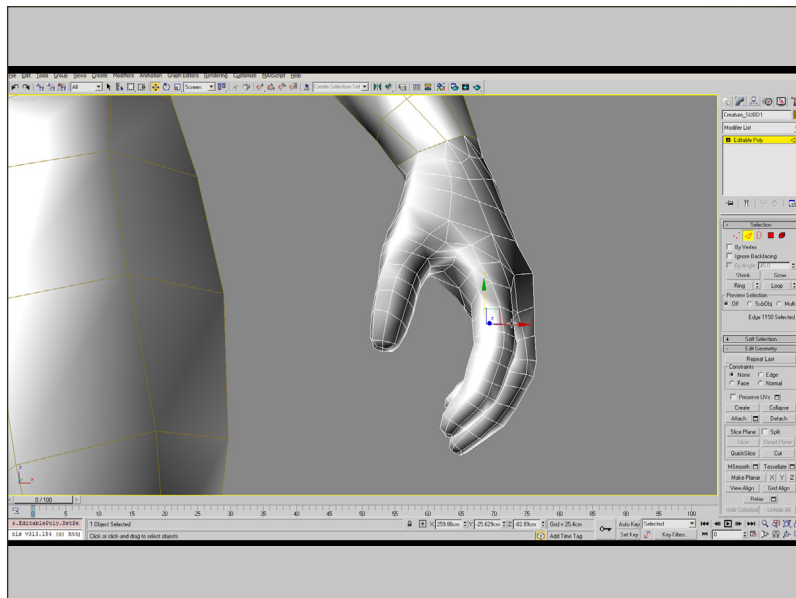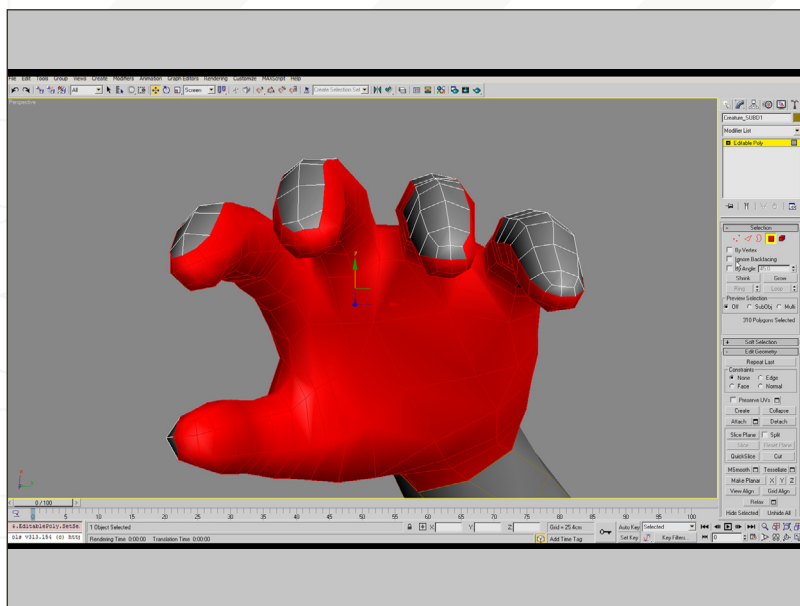
Fig 06a

6. Things get a little bit trickier as we move on to the hand. We need to only select the half of the hand that's visible from the palm side. We also need to think about where the seam will be most visible to the player. It's no good putting the seam right on top of the knuckles because it will still be visible (especially from a distance) no matter how much we try to hide it. Opt to place the seam along the inner edges of the fingers. This way, if the character is offering you something with the palm of his hand, open or punching you and exposing the back of his hand, the seam will not be visible (**Fig.06a – 06b**).
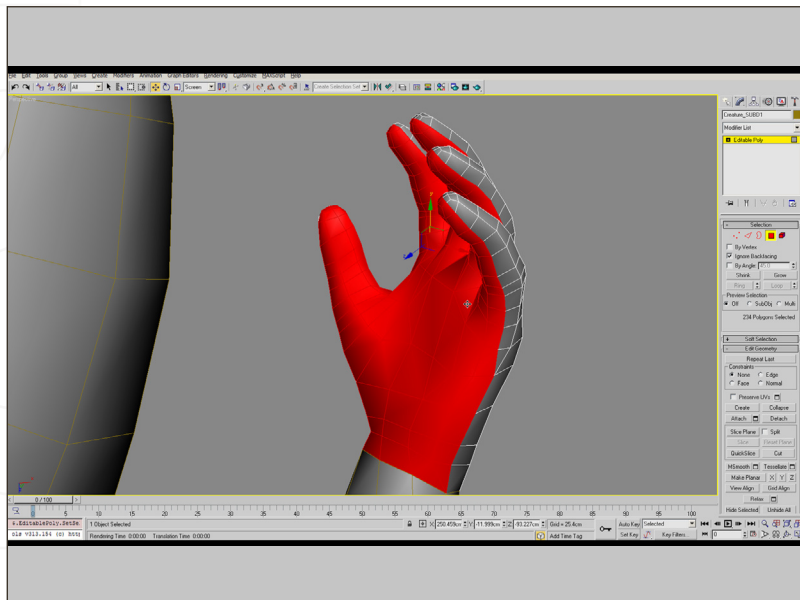
Detach the hand polygons that we have selected, and then select and detach the remaining polygons on the back of the hand.
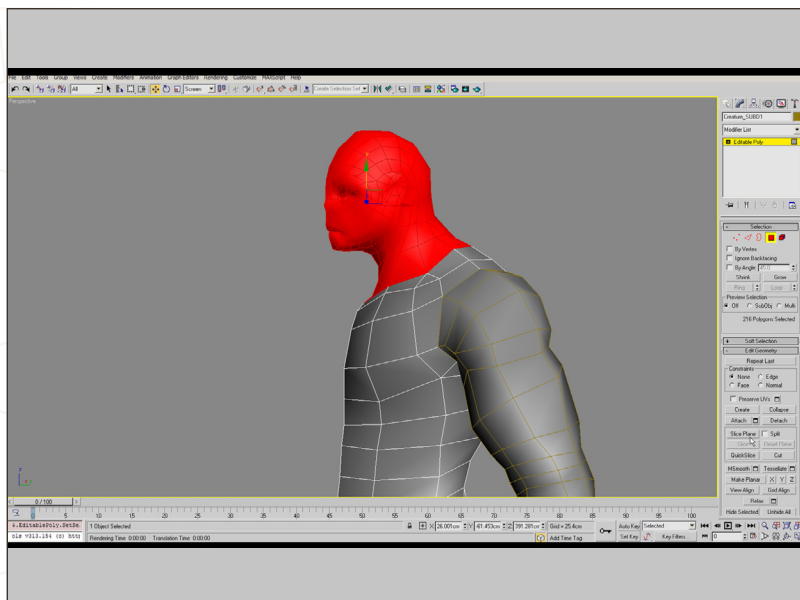
Fig 06b

Fig 07

7. We'll now move on to the head of the character. Select the polygons from the top of the head to the bottom of the neck, where the neck muscles meet the chest at the collarbone. Make sure the polygons are in a loop with no stray polygons selected (**Fig.07**).

8. Now detach the head from the model, and then select the front half of the body. There are only two sections left to detach at this point – the front and back of the torso. Make sure the front is cleanly selected and go ahead and detach it. There is no need to detach the back since, as it is the final section left, it has already become one individual object (**Fig.08**).

Fig 08
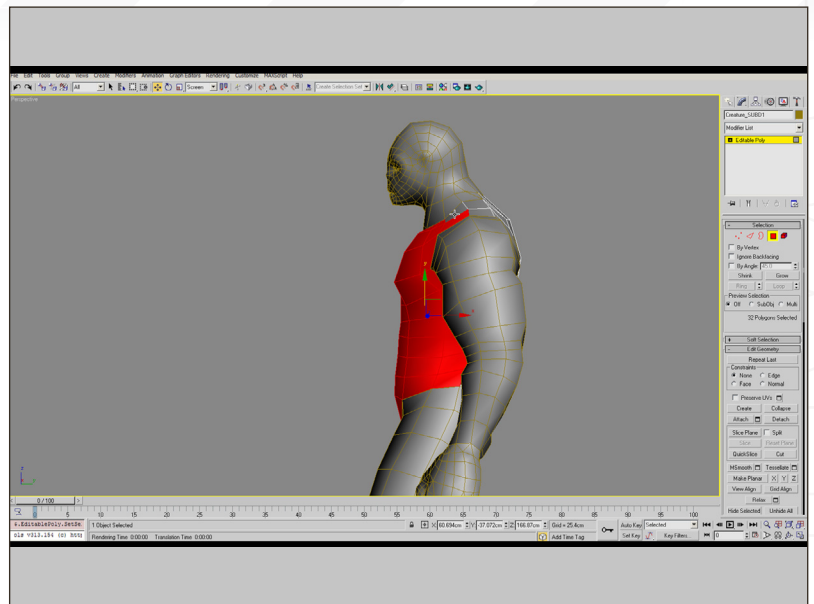
9. We can now go ahead to unwrapping each of the individual sections that we have created. Let's start with the foot. It's not necessary to name any of these objects as we'll soon be stitching them all back together again, and it's pretty obvious what they all are. Find and select the foot object. Using the modifier panel on the right-hand side of the screen, use the drop-down menu at the top and select Unwrap UVW (**Fig.09**).

Fig 09
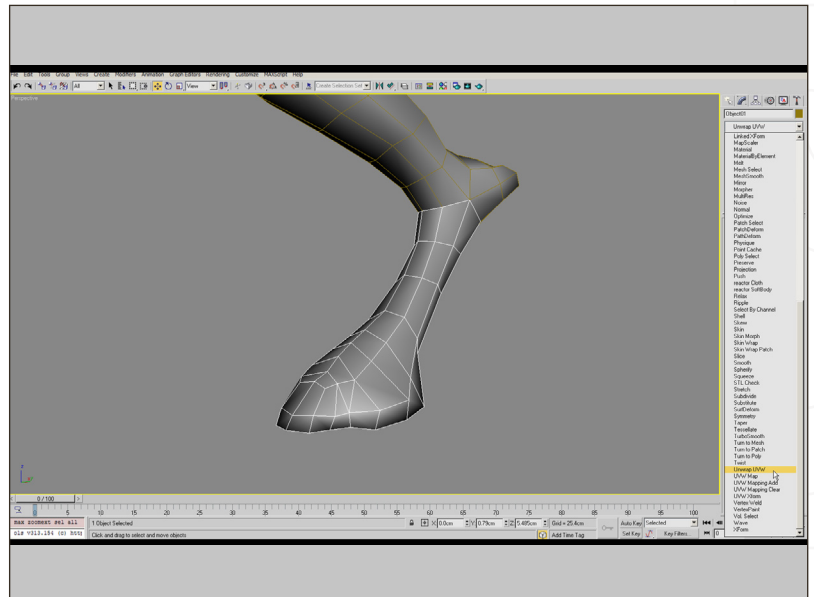
10. Once a modifier has been applied to the object, click on the button labelled Edit Seams. The button will be highlighted so you know it is active. We can now look at the seams that will be used to un-wrap the object. Think of a map of the world and the way the spherical globe has been cut in certain locations and flattened out into a 2D plane. We'll be performing that same transformation, though since we're working with a different shape we'll need to apply our own seams in order to create our 2D plane. When unwrapping objects in Max we decide on the locations of those seams ourselves, so it's best to un-wrap the object with minimal distortion. Click on the check box called Show Map Seam. This will hide the current seams in the map which we have not yet unwrapped or modified (**Fig.10**).

Fig 10

Fig 11

Fig 12

Fig 13
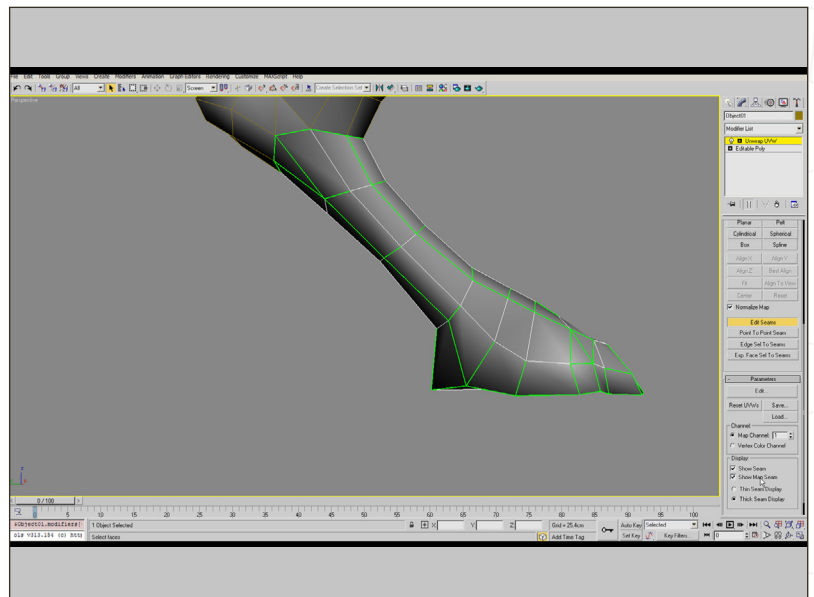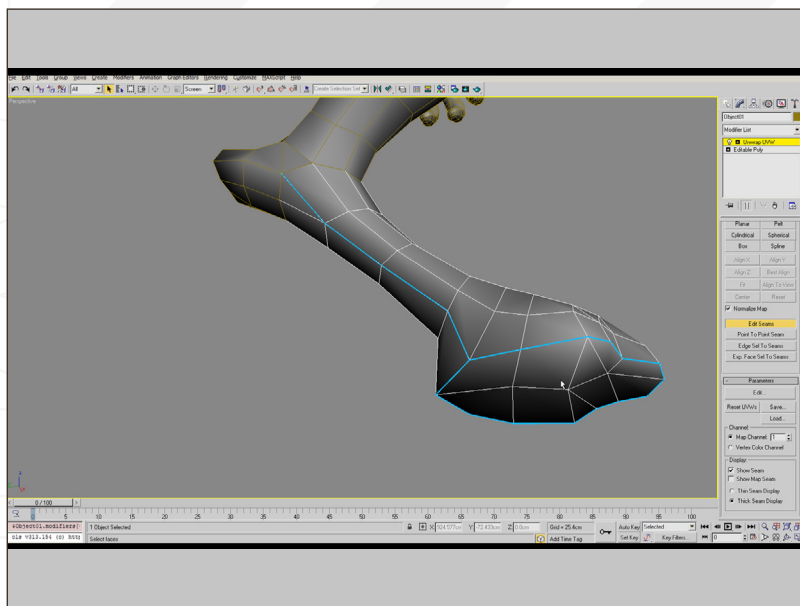
11. Now click on the edges that are highlighted in the screenshot. The bottom of the foot will be a separate part of the map because the leg will later be unwrapped like a cylinder. Our seam placement will determine the location where it will be broken and unwrapped. The seams used for unwrapping are highlighted in blue, whereas existing seams are highlighted in green (**Fig.11**).
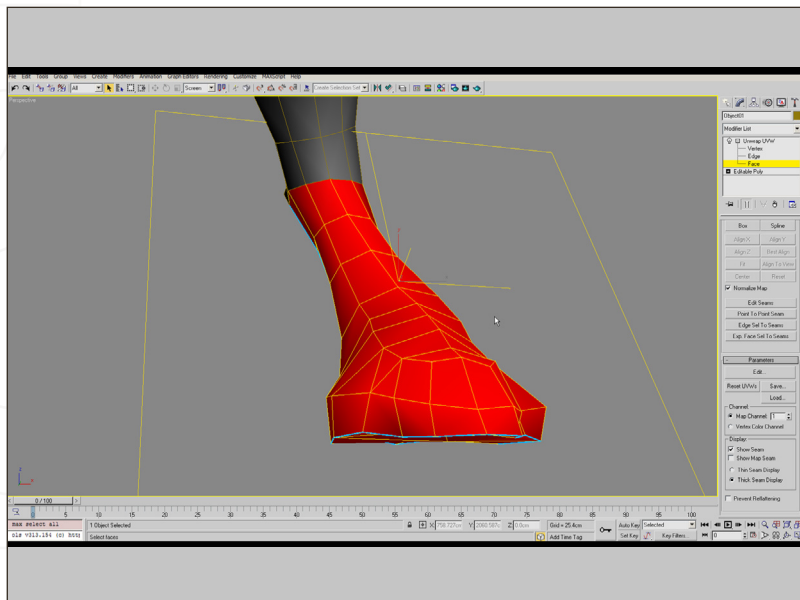
12. Expand the Unwrap UVW modifier and select Face Mode; alternatively you can press 3 on your keyboard. Now select all of the polygons by hitting Ctrl + A to select everything. You can also draw a rectangular box around the object, but be careful Ignore Backfacing is not selected, as this will only select the polys facing the camera (**Fig.12**).
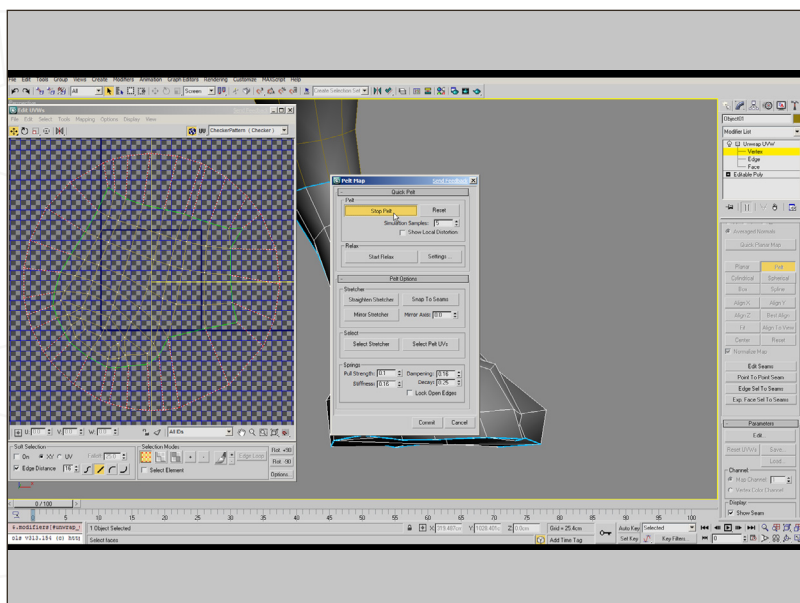
13. Click on the button labelled Edit Seams to deactivate it, then scroll up in the modifier panel and find the Pelt button. The Pelt Map dialogue will display. Quite a new feature in the industry, pelt automatically unwraps our object, trying to find the optimal size of the polygons in the UV map to match the size of the polygons in the actual model. This gives a lot less distortion and allows us to paint a texture without worrying if it will be distorted once applied to the model. Show Local Distortion will display edges in either red or green – green being perfectly sized edges with no distortion and red being edges that are either too small or too large. Turning this on can be very useful in determining how much pelting is necessary. Simulation samples increase the accuracy of the pelt, although loading the simulation makes the process slower.

Click the button labelled Start Pelt and watch as the model is pulled out like a big net. If areas are overlapping or fighting each other, it's probably because a part of your model has not been cut properly. Exit Pelt by clicking Cancel and make sure the map seams are placed correctly. Try to envision how the model would unwrap if you created it from paper and made cuts where your seams are placed, and fix any parts that wouldn't be able to lie completely flat (**Fig.13**).

14. Once all our seams are well placed and we click the Start Pelt button to stretch out the model, we could call it done. However, it's not optimal yet. I believe after applying a pelt mapping to the section of mesh, it's also important to apply a Relax function to it (**Fig.14**).

15. Relax by Face or Relax by Edge Angles produce similar results; they compare the angles of the model with the length of the faces and edges in the UV map. As a finishing touch to the pelt map, this can provide us with a shape that more accurately resembles our object. It is also more efficiently shaped to fit into a tight UV map. It's not necessary to change any settings, but you may wish to alter the amount value to get a stronger or lighter relaxation of the map.

The pelt map only does one element of an object at a time. As our mesh was cut using the seams we created, each individual section has not yet been pelt mapped. Let's start with the foot. We can click Commit now in the Pelt dialogue and move the mesh to the side. You may need to exit Pelt mode, because once a pelt mapping is performed it automatically remains in the mode. Simply click on the Pelt button to deactivate it. Now click on Select Element to quickly select elements of a mesh. Select the bottom of the hoof using Select Element and click on the Pelt button again. Click on Start Pelt again, and then proceed to relax the element. Once you are happy with the result, move the bottom of the foot next to your leg element (**Fig.15**).

16. Our next step is to apply a checkerboard texture to the foot. We should apply the texture every time we finish un-wrapping an element. This keeps things visually clear to us, as pieces with a checkerboard texture have been unwrapped and pieces that are grey still need to be done. It also lets us work out which sections need to be changed. Ideally we are looking at having all polygons on the map the same size, so some may need to be sized up or sized down.

Fig 14

Fig 15

Fig 16

Fig 17

Fig 18

Fig 19
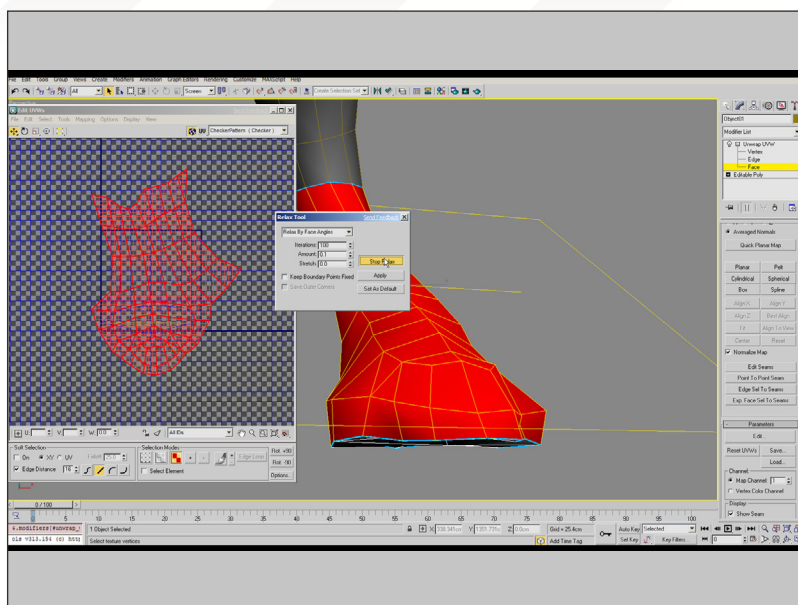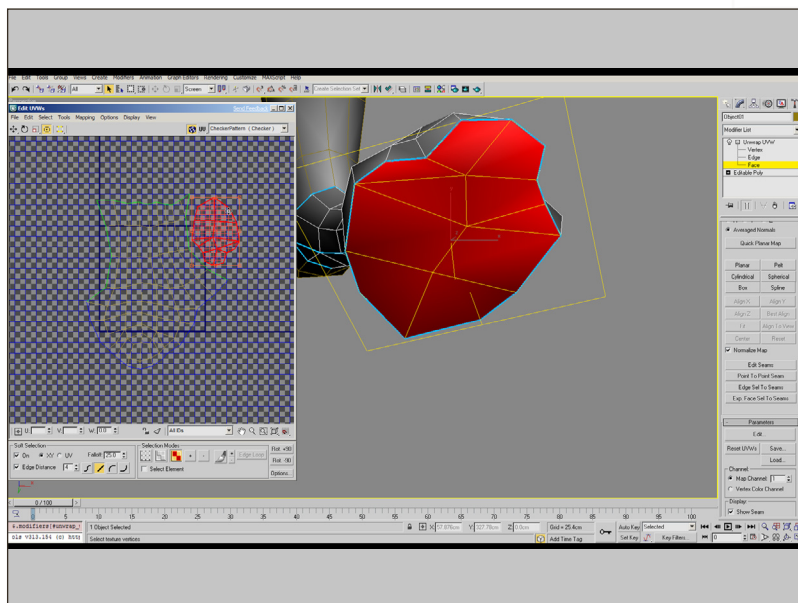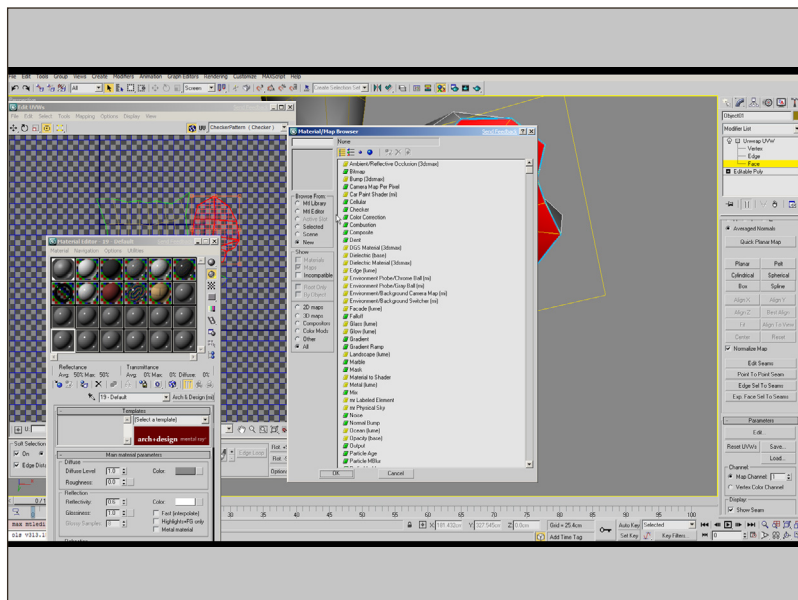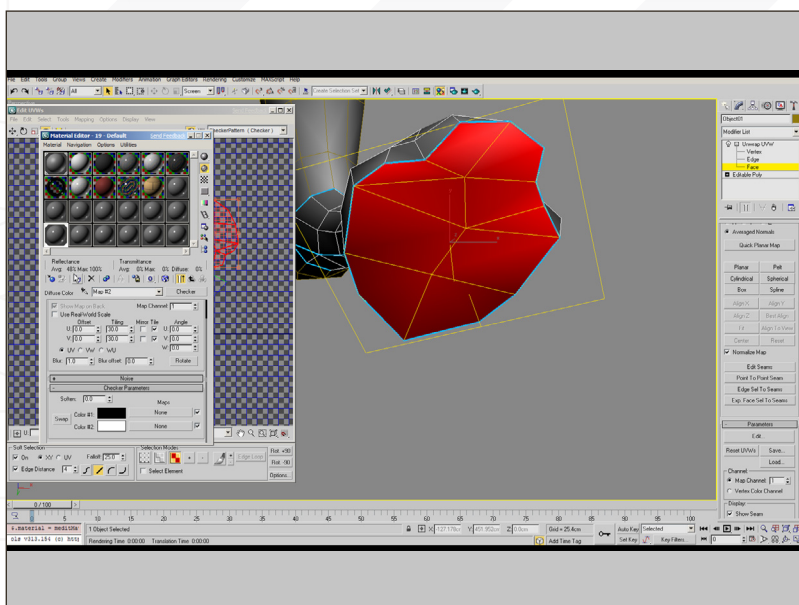
Press M to bring up the material selection window. This is where we apply regular materials in Max. I'm using Max 2009 and the default materials are Arch & Design materials. However, this will also work fine with standard materials and the process is the same regardless of which ones you use. The little blank squares indicate an area to put a procedural shader or texture map. Click on the one next to Colour and select Checker from the list (**Fig.16**).
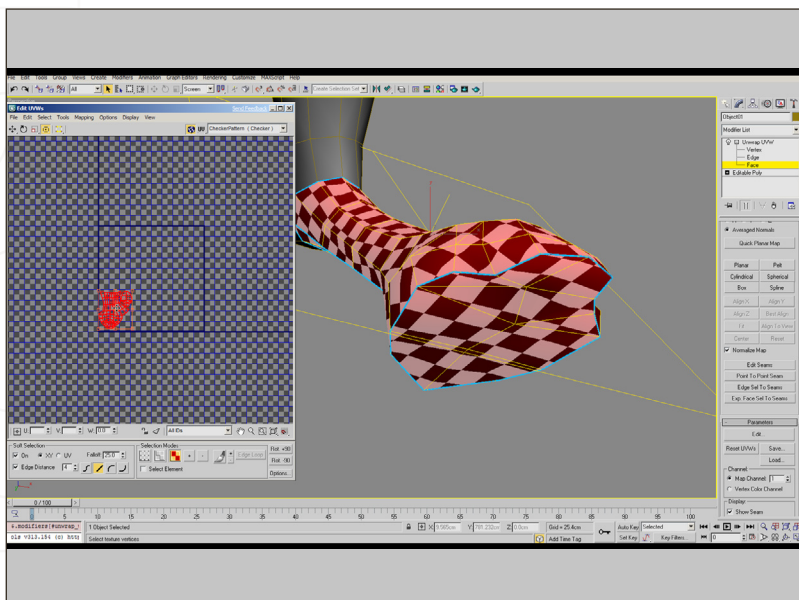
17. Checker is a procedural texture which we can assign to our colour slot and then vary the size and colour of the checkerboard. It's perfect for judging the amount of UV space our object section occupies. A very important part of UV mapping for games is this polygon ratio. We want to make sure all sections of the model occupy the same amount of UV space relative to their size. This is most noticeable when we apply a tileable normal map or bump map. If the ratios are off, the difference in the size of the bump will be dramatic between seams and will draw attention to our seam areas, which is something we must try hard to avoid.
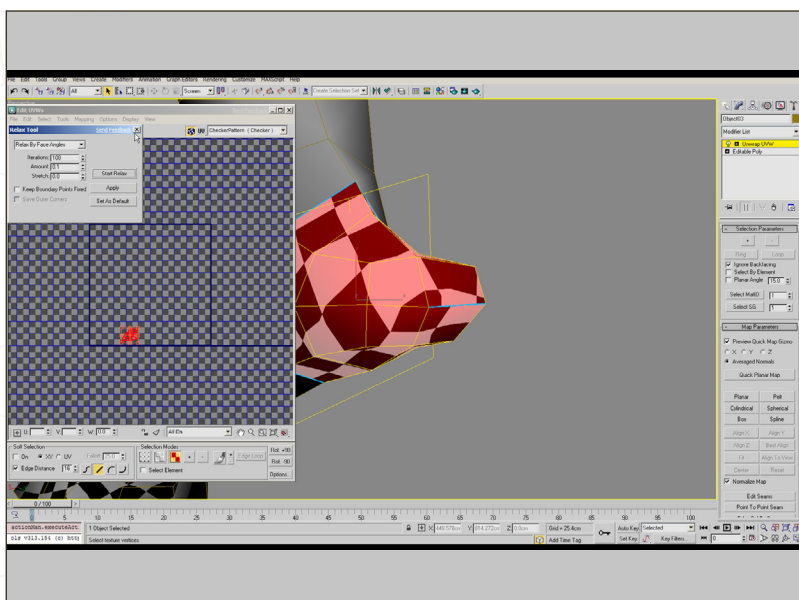
Once the checker material has been applied to the colour slot, it gives us a bunch of options to control the tiling, colour, and other aspects. The only areas we need to modify are the U- and V-Tiling, and I recommend setting both to 30. You may also want to change the black and white colour swatches to colours that are easier on the eye – changing the black colour to pastel blue usually works quite well. Simply click on the colour swatch in order to select a new colour.

Click on the button highlighted to apply the material to the active object. You will also need to click on the chequered cube icon on the right. This is the Show Selected in Viewport button and will display our material on our object (**Fig.17**).

18. Now open the Edit UVWs window by selecting Parameters > Edit in the modifier panel. Select your entire object in the UV map,

scale it down, and move it into the bottom left. We don't know exactly where it will go yet, so we are just going to line each section up so as not to overlap. This way, when we come to stitch the parts together later, they will be easier to select and move (**Fig.18**).

19. Go on to apply the same technique to the other parts of the model, working your way up from bottom to top (**Fig.19**).

20. Select the seam that goes all the way up the inside of leg. It's important again to choose a seam location that will not be visible to the viewer (**Fig.20**).

21. Work your way up to the head. The front and back should be easy to unwrap, but the head can be a little more difficult. We can select the seam from the middle of the top of the head running down to the ear. That should make it easy for the head to unwrap smoothly and without much distortion. Adding a cut underneath the chin can also help to unwrap it a little more smoothly, although it's better to weld that back together afterwards. The more seams a model has, the slower it can run in some game engines, and also the more work we have to do to make sure the texture matches up across seams (**Fig.21**).

22. Select all the polygons of the head and start the pelt mapping. The head can be quick to collapse into itself, so make sure when you relax you don't use too high an iteration level or amount. You can pull out the control points of the stretcher to adjust the way the pelt pulls the UV mesh (**Fig.22**).

Fig 20
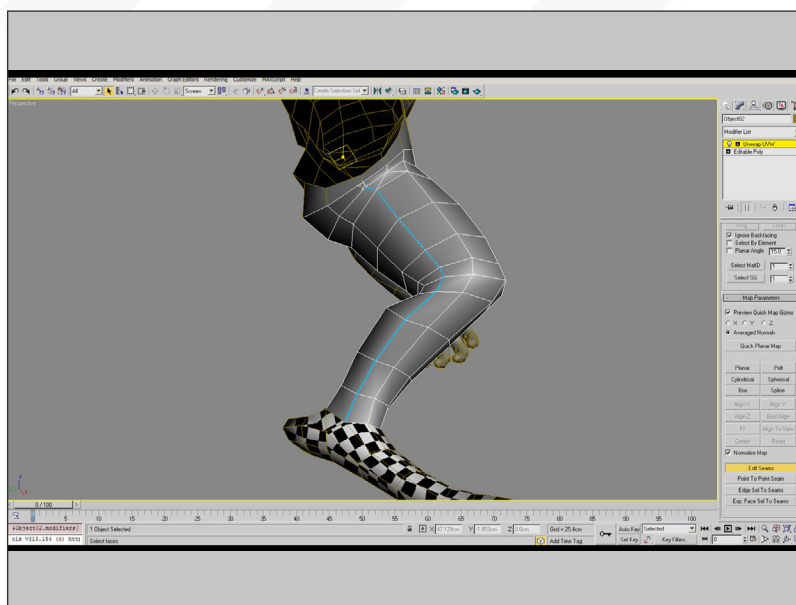
Fig 21
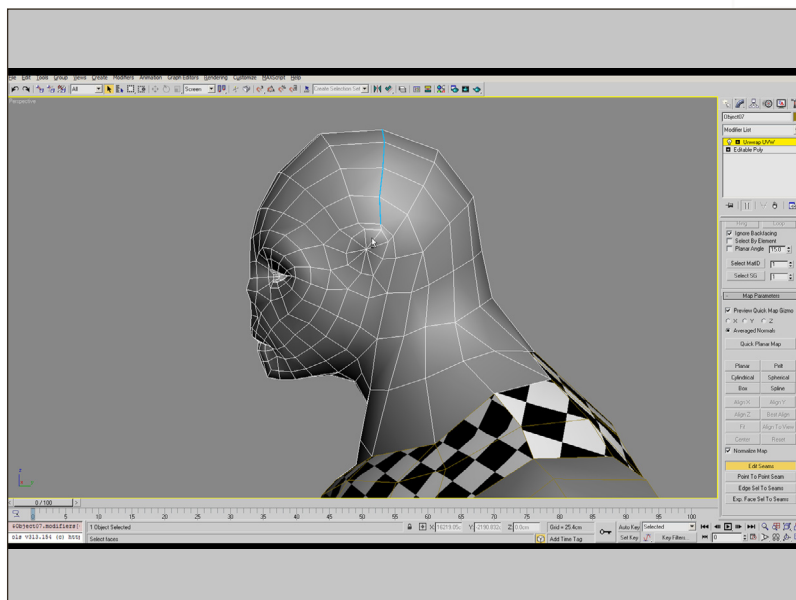
Fig 22
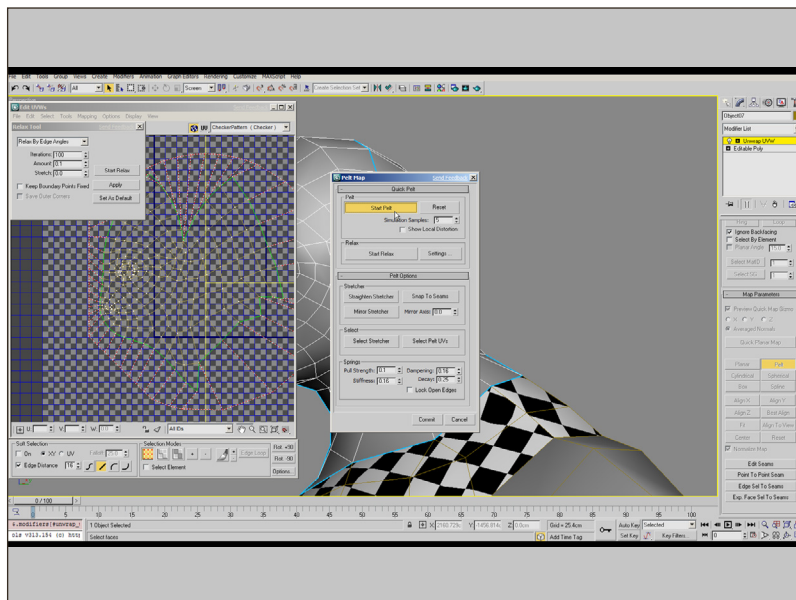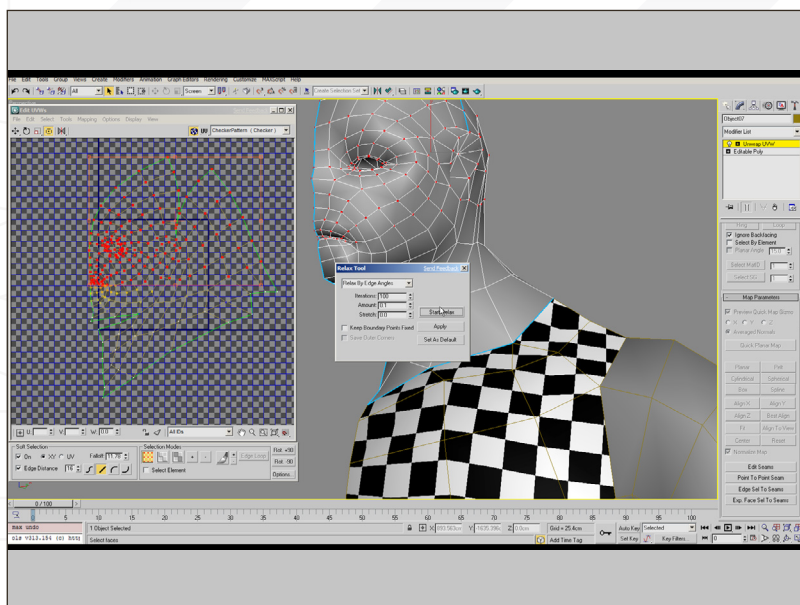
Fig 23

23. Commit to the pelt mapping and work on straightening out the middle line of the mesh. Utilising the Soft Selection falloff lets us move around a lot of UVs at once, with the UVs moving less and less as the falloff reduces. Turn on Edge Distortion in the display menu to make sure when you are pulling the UVs around you maintain as many green edges as possible (**Fig.23**).
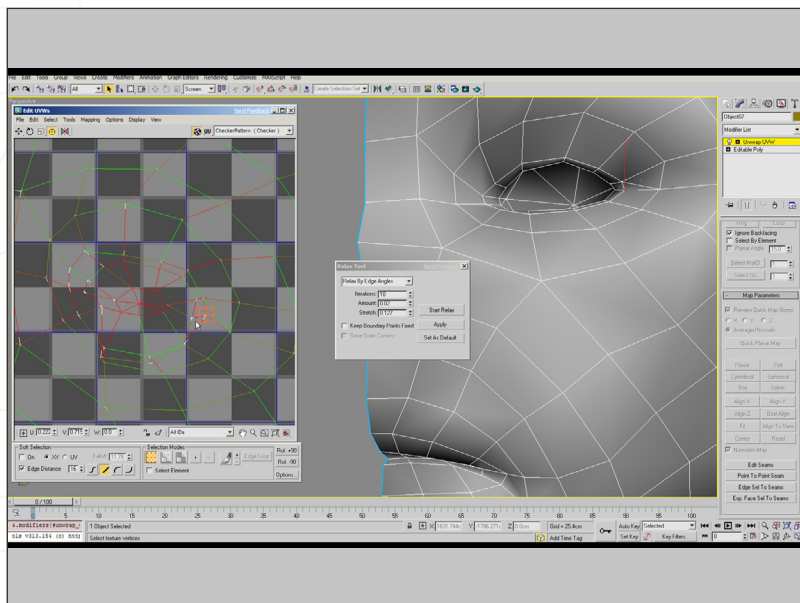
Fig 24

24. Once you have the head unwrapped and have straightened out the distortion, we can work on optimising it for painting our texture. The first area to work on is the eye. As our eyeball will be a separate texture we will not be painting it into this map. This means we can use the whole of the eye area to cover the upper eyelid and give us a little more resolution on this highly detailed area. Start moving the UVs inwards towards the centre point of the eye, keeping a watchful eye out for the edge colour distortion (**Fig.24**).
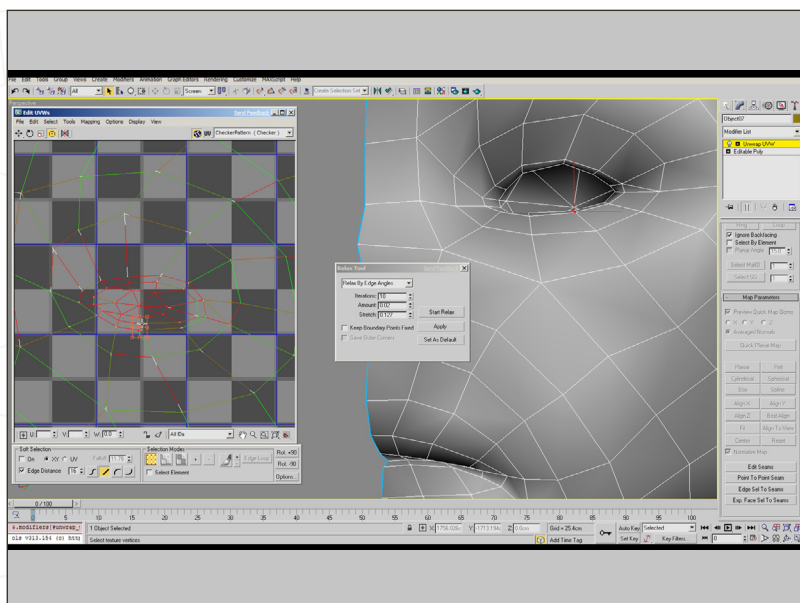
Fig 25

25. The completed eye should look roughly as shown here (**Fig.25**).

26. The straightening of the centre line creates some ugly distortion around the neck, so work on smoothing out and rectifying these areas (**Fig.26**).

Fig 26
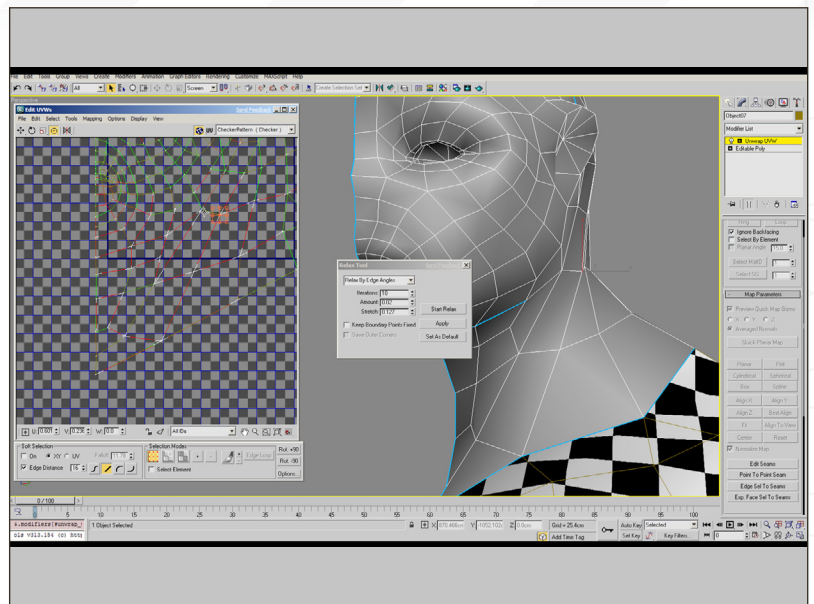
27. The hand should also be easy to un-wrap; just make sure to tweak the UVs to aid the texturing process. This means trying to make sure the un-wrap resembles the actual model. The fingers should run into the wrist, and the fingers should be straight instead of bent so we can drop photo textures onto them with minimal modifications. I prefer to un-wrap the hands into one front piece and one back piece – though, un-wrapping each finger individually is a common alternative (**Fig.27**).

Fig 27
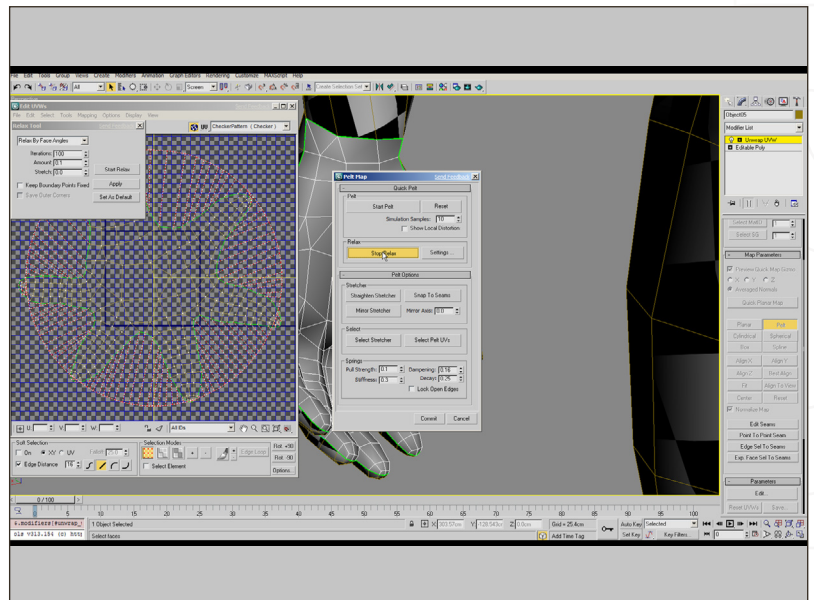
28. Unwrap the other side of the hand and the back of the character if you have not done so already. Make sure you place your checker material on each of the unwrapped sections. Now that we are done with the first phase of the unwrapping we can work on equalising our UV ratios (**Fig.28**).

Fig 28

Fig 29

Fig 30a

Fig 30b
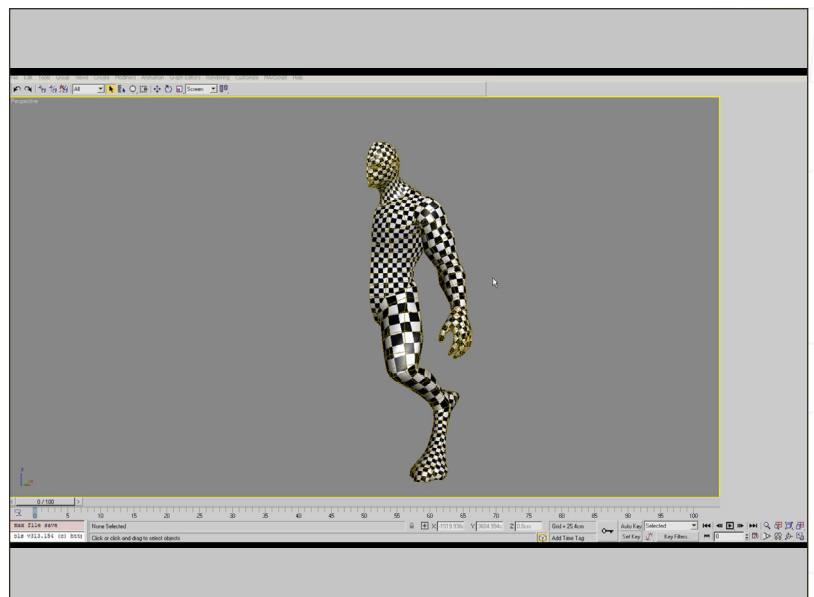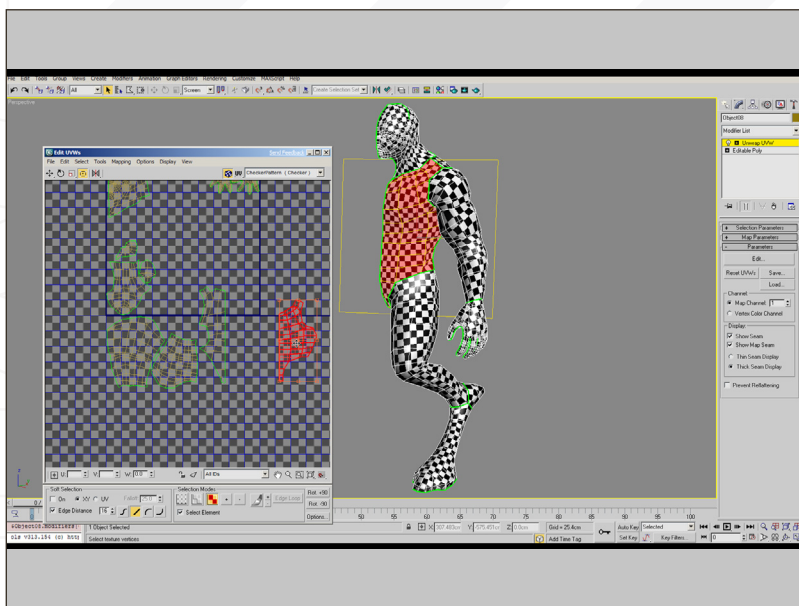
29. Select any part of the character and collapse the modifier stack by right-clicking over Unwrap UVW in the modifier list and selecting Collapse All. You could also right-click over the model and hit Convert To > Convert to Editable Poly. Now in the modifier panel for editable poly, click on the button labelled Attach Multiple. A selection floater will display with all our scene objects in. Select them all by dragging over them, or hit the All button and click OK. Now all our objects are one again, although they are not welded together yet.

Add an Unwrap UVW modifier to the model, and hit Edit. We should be scaling each part of our character, so in the viewport the checker squares appear around the same size all over the model. Pay close attention to the hands and head. If there are any areas where the checkers do not look square, we can move individual UVs in the editor to try to equalise their shape. Don't worry if the squares are not perfectly grid-like. Due to the rotation of some objects they will not all be applied in a grid-like way (**Fig.29**).
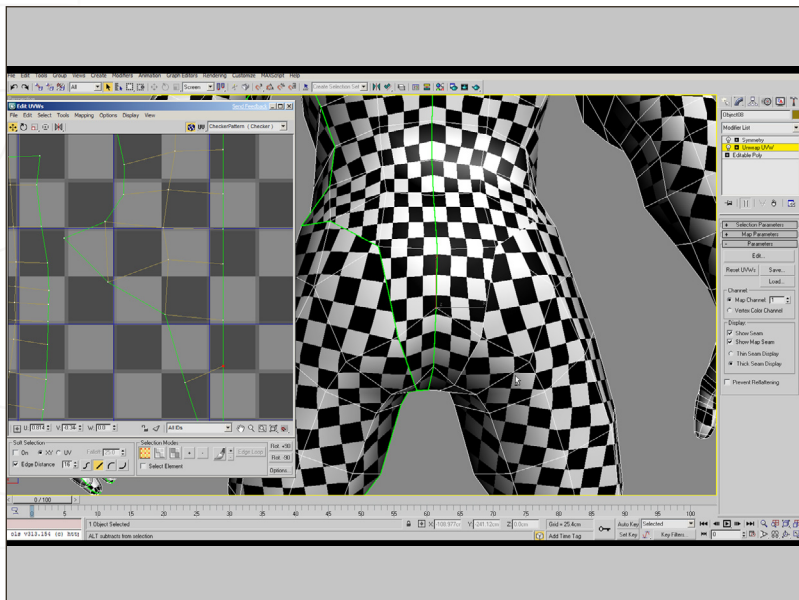
30. Collapse the model once you are done and apply a symmetry modifier to the mesh. Turn off Slice Along Mirror, flip, and make sure the X check box is selected. As we did in the first part of this tutorial, increase the weld threshold just enough for all UVs to weld together along the centre line.
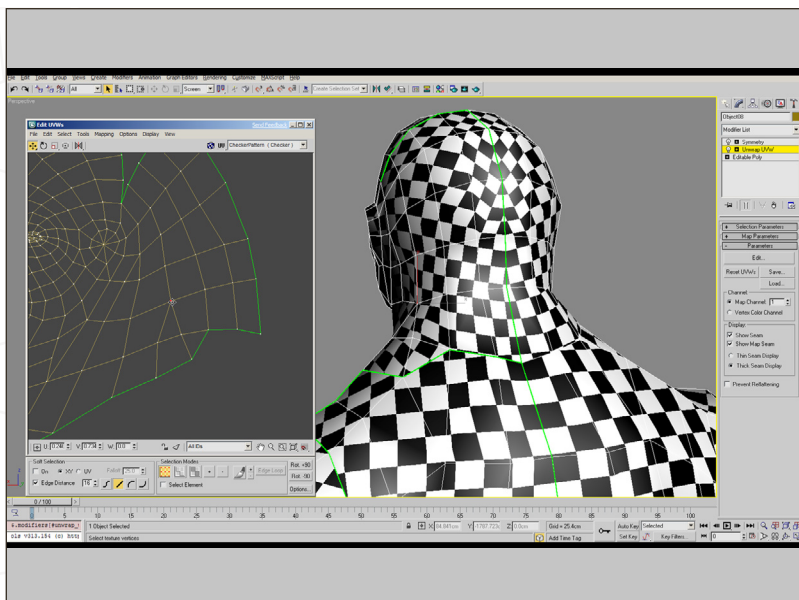
Now that the model is symmetrical once again, we can do a final pass tweaking the UVs along the centre line. Add an Unwrap UVW modifier underneath the symmetry modifier and tweak areas such as the crotch, lower back, and back of neck.

Next, collapse the Unwrap UVW modifier by right-clicking on the modifier and selecting Collapse. Click Yes when any warning dialogue pops up. You can't right-click and convert this time as we need to retain the symmetry modifier. Once collapsed, add a new Unwrap UVW on top of the symmetry modifier ready for the next step (**Fig.30a – 30b**).

31. We need to get our UVs mirrored and welded now, so make sure Select Element is active and click once on UV from the head section, then drag the selected mesh over to the side. Do the same for each section until you have a copy of each. Of course, these aren't actually copies, but the 'unwraps' for the other half of the model. Select each one in turn and hit the Flip Horizontal button in the Edit UVW window. If you hold your mouse on this button you will be able to select Flip Vertical also, which can be useful later for arranging your pieces (**Fig.31**).

Fig 31
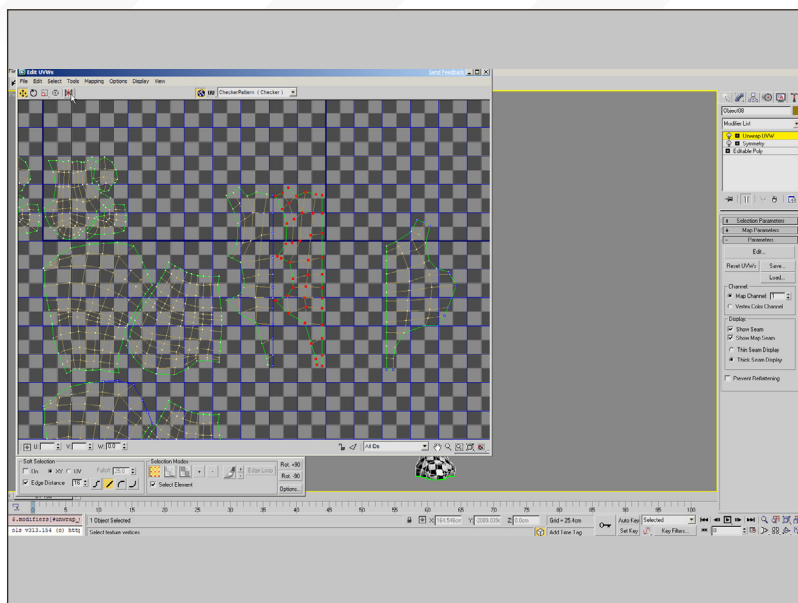
32. Flip each piece in turn and, once done, move them together as close as possible so the centre lines are in exactly the same place (**Fig.32**).

Fig 32
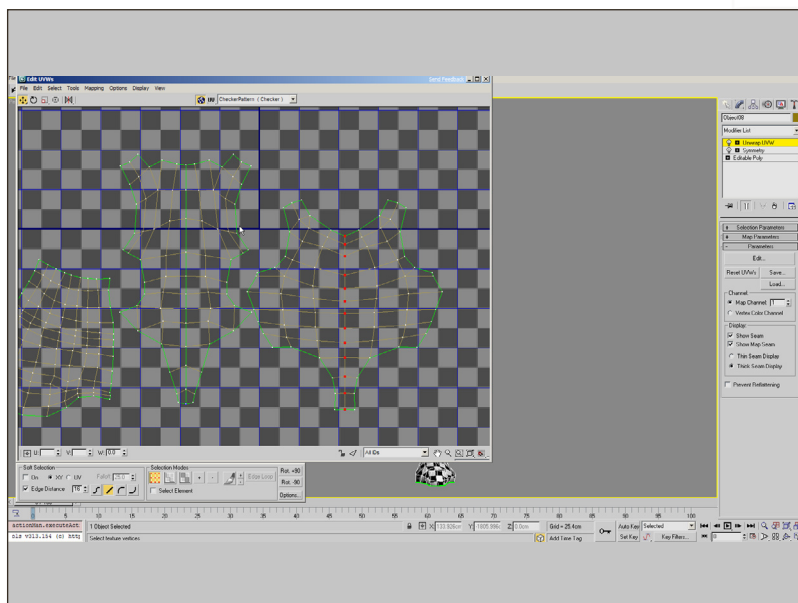
33. Select all of the centre line UVs and scale them together using the UV Scale tool (next to the Flip icon). Whilst the UVs are still selected, right-click over them and hit Weld Selected; this welds the verts together, eliminating any seam from view. Go on to do the same process with each of the piece pairs. Some, such as the face, will have UVs that are too close together and therefore bunches of UVs will get welded together by mistake. To lower the weld threshold look to the bottom of the Edit UVWs window, click on Options to expand the menu, and tune down the value of the weld to something much lower. Remember that holding Alt key whilst using the spinner will increase and decrease the value in much smaller increments, allowing you to be more accurate (**Fig.33**).

Fig 33

Fig 34

Fig 35

Fig 36
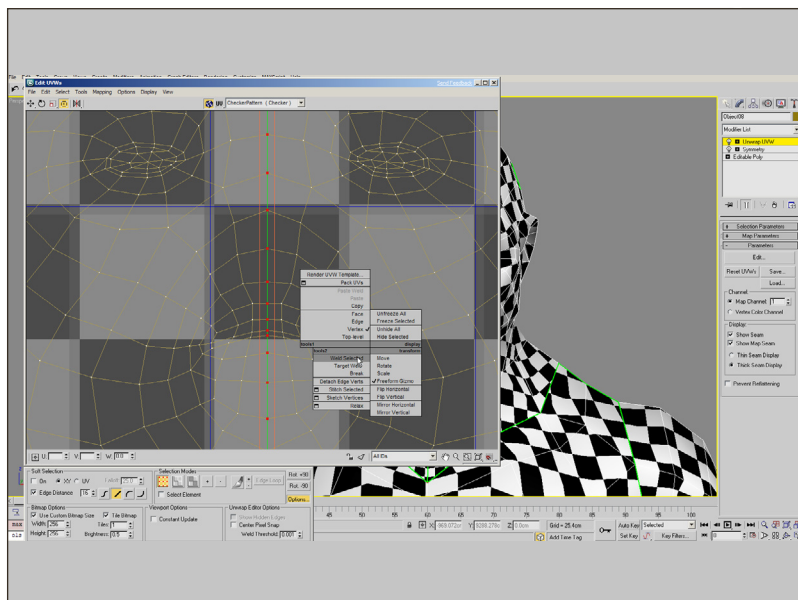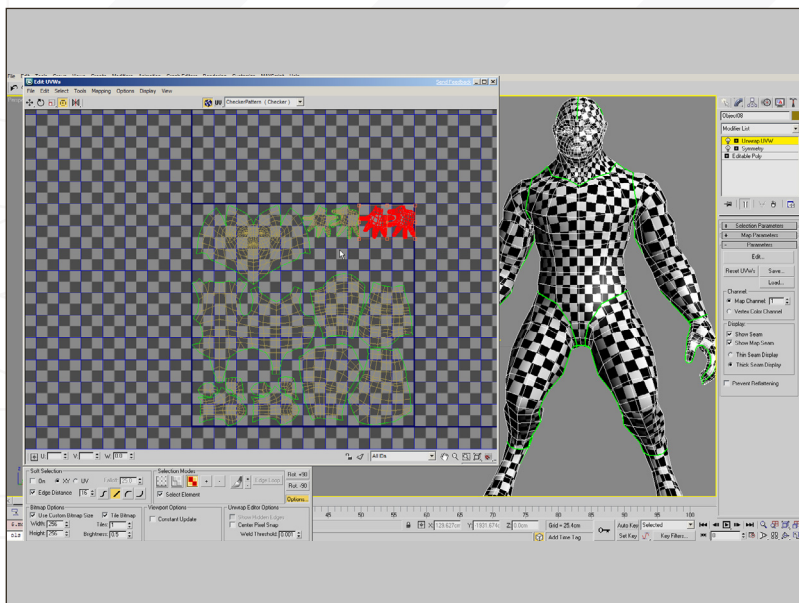
34. It's time to start arranging our new pieces on the board. This bit is really like a jigsaw puzzle, finding the best way to position all our pieces so no space remains. The less space there is, the higher the resolution we will get for our textured pieces. There are also other aspects to consider. If you're not the one doing the texturing, it's nice to make everything clean and understandable. It's best to keep fingers and thumbs together, rather than scattered around the document in random pockets of unused space. It's also a good idea to keep things the right way up. Make sure the head and body are upright – and the back, too. It's not always going to be possible to have everything right-side up and it's certainly okay to have one arm upright and the other upside down. The same goes for the legs and hands, as this can sometimes help with fitting things together. However, try to keep everything as organised and clear as possible (**Fig.34**).
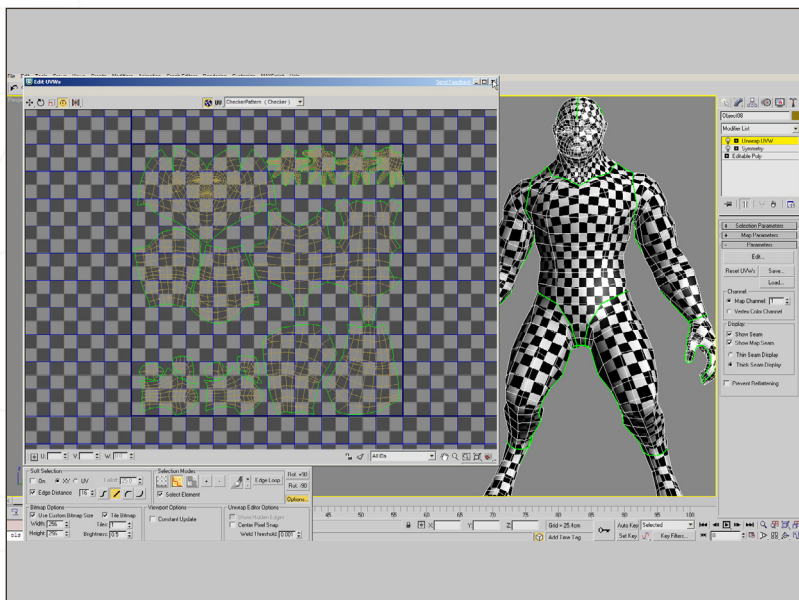
35. Complete the jigsaw now, remembering to leave a little space for the accessories. The metal chains and the weapon will need to be fitted in later if you decide to put them on the character texture sheet. If the accessories will be reused across many other characters then it often makes sense to put them on their own smaller map. It's also better to put them on a smaller map if they have an alpha channel, as it's a waste of a full-size alpha channel texture if it's only for one object on the map (**Fig.35**).
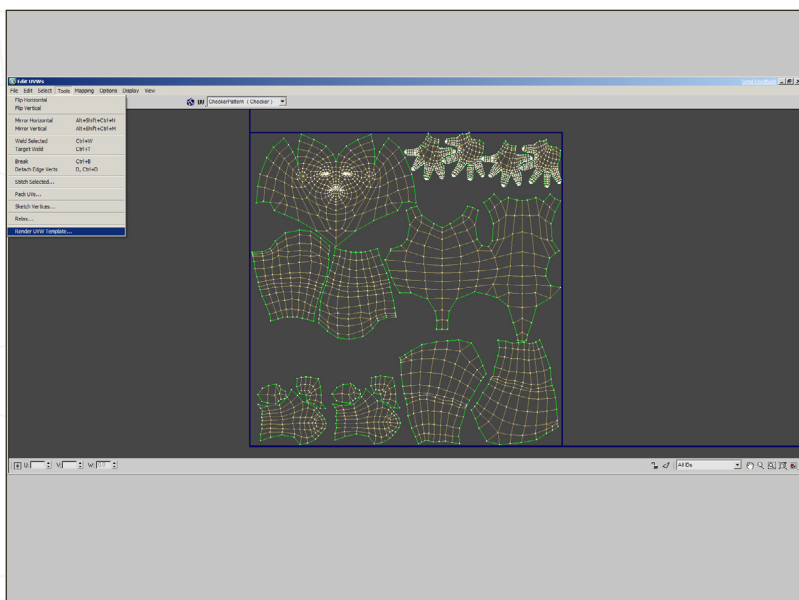
36. As a final step, we should generate a UV Template that we can use to overlay our texture in Photoshop. It will help us remember where our borders are, and will give us a good guideline for a paint-on in addition to our lighting baking solution.

Open up our Edit UVW window and click on Tools from the menu bar. Then click on Render UVW Template (**Fig.36**).

37. We have a new options box that pops up, and the main things to change are the width and height. In our case we should change them to 2048 by 2048. The in-game resolution of the character's maps will be either 1024 by 1024 or 2048 by 2048, so it's best to be on the safe side and create our textures at high enough resolution. It sounds like common sense, but it's a lot easier to downsize a texture than to upscale it.

At this point any overlaps should have already been fixed, so turn off Show Overlaps. All that's left to do is click Render UV Template.

The newly created UV Template will pop into view. Simply click the little diskette icon and save it as a .bmp file ready to load into Photoshop in the next part (**Fig.37**).

38. The final UV map (**Fig.38**).

Our character is now well on his way to being brought to life. He's been modelled, sculpted, and now unwrapped. Unwrapping is a tricky business and can seem somewhat uncreative and monotonous. But like any craft, there are parts that just need to be done, and done well, to enable the next phase to run smoothly. I hope I've shown that it need not be as complex as it seems (no pun intended). An unwrapped model can be heaven or hell for texture artists, and it's an extremely important skill to learn for life in the games industry.

Creature Concept by: Richard Tilbury

Tutorial by:

Joseph Harford

For more from this artist visit:

http://josephharford.com/

Or contact them:

Josephharford@googlemail.com

- Free Low Poly Mapped Base Mesh

Fig 37
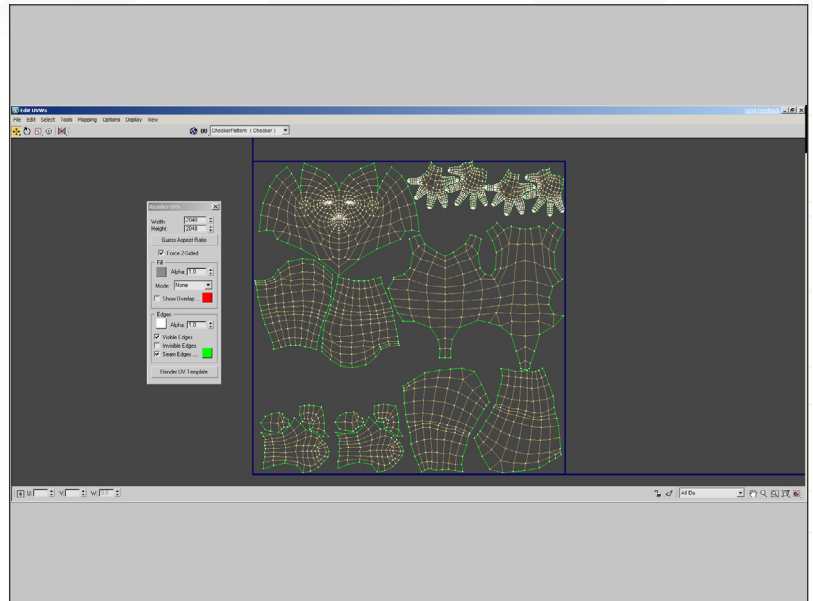
Fig 38
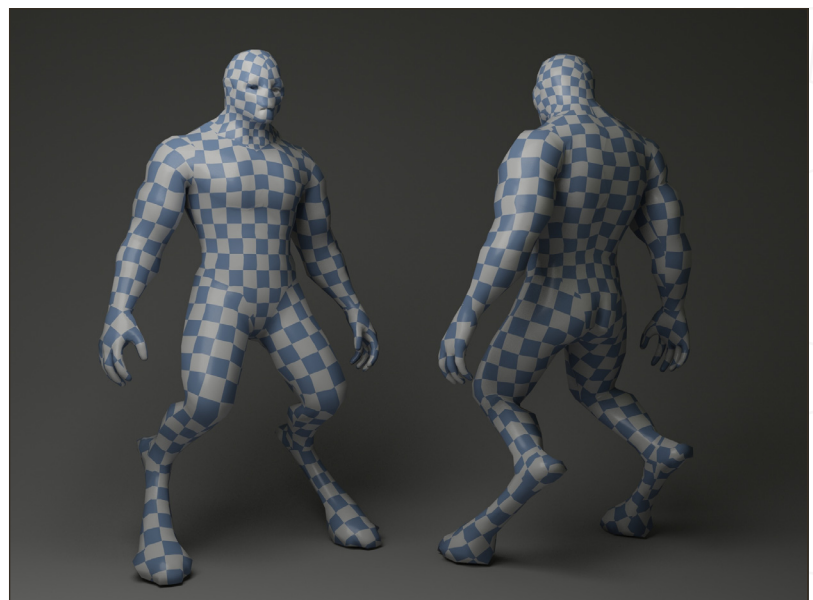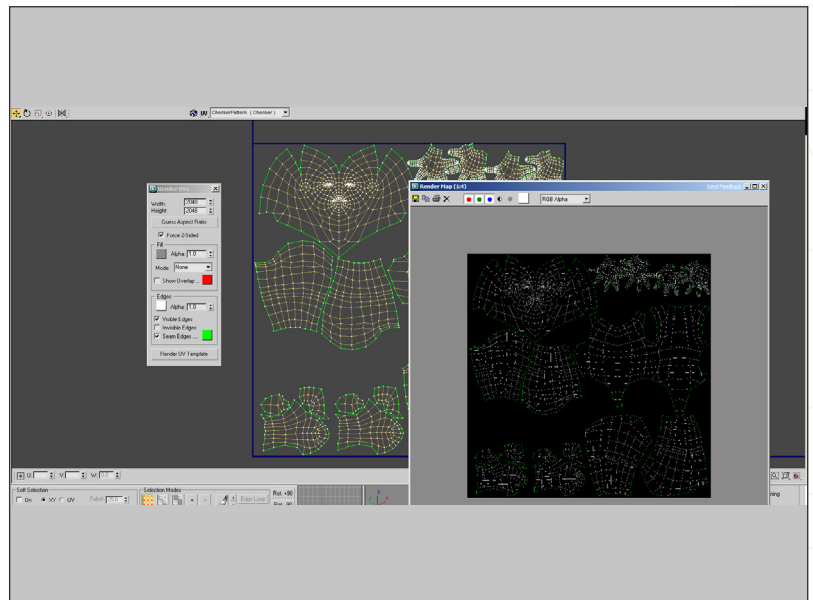
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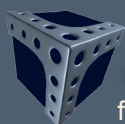
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NEXT GEN
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This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

CHAPTER 4 – MAPPING / UNWRAPPING

This part of the tutorial will focus on a vital part of the pipeline in readiness for the texturing phase, namely the mapping and unwrapping. It will provide an insight into various approaches to mapping and show how to go about exporting a wireframe template to be used as a guide in preparation for the next chapter.

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CHAPTER 4 - MAPPING / UNWRAPPING

Software Used: LightWave

Welcome back to our next-gen character creation tutorial series for LightWave. After the last two months' of ZBrush sculpting we are now on the home straight and our finished character is within sight. This month we'll be concentrating on a vital part of the process: unwrapping. Unwrapping, or UV mapping, is the process of splitting your mesh up into parts that are then flattened and arranged ready to be painted on. There are many methods to unwrap a mesh, and I'm going to show you my most widely used and recommended, in LightWave.

1. To begin, export the lowest iteration of your model from ZBrush. Although we imported our own base mesh when we started the sculpting process, the mesh might have changed slightly, so importing our base subdivision level from ZBrush will ensure we have our latest version and it will be more accurate in general (**Fig.01**). We can also further adjust the mesh to fit the high-poly version, now that we know which areas need modifications.

2. Let's start by chopping our model in half. We only want to unwrap half of our model, as we will create symmetry later by flipping half the character's UVs to create the other side. Select the character's right side, making sure all the polygons in the X-axis are selected. Pay close attention to the mouth area, which has the highest concentration of polygons (**Fig.02**).

3. In order to UV the mesh we're going to use the free PLG UV unwrapping plugin: http://homepage2.nifty.com/nif-hp/index2_english.htm.

The first thing we need to do to prepare the mesh for unwrapping is to divide it up into manageable sections. For this tutorial we're going to cut the body into seven sections: body, arms, hands – top, hands – bottom, head, feet, and upper leg, as illustrated in **Fig.03**.

Fig 01
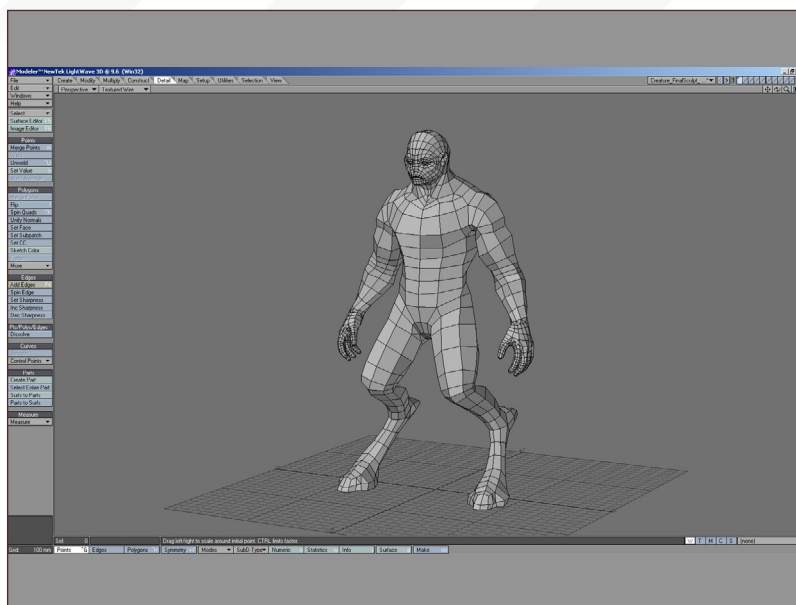
Fig 02
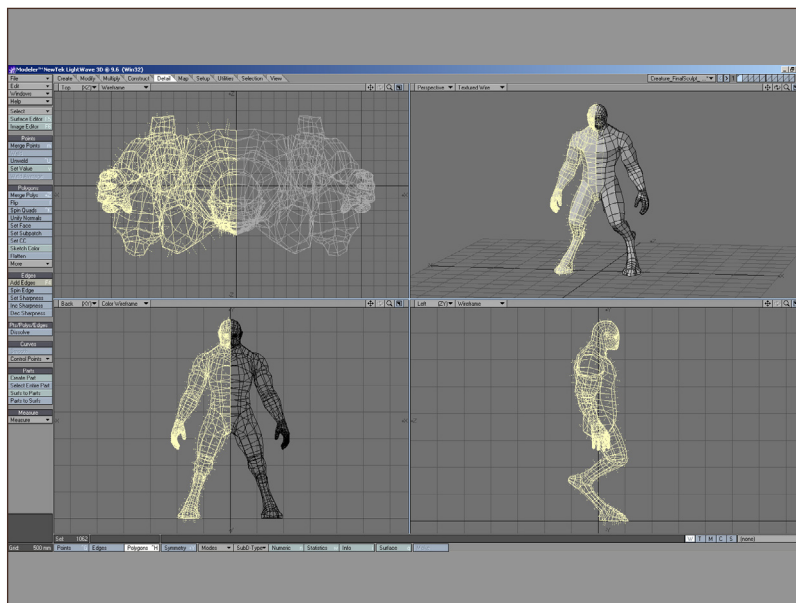
Fig 03
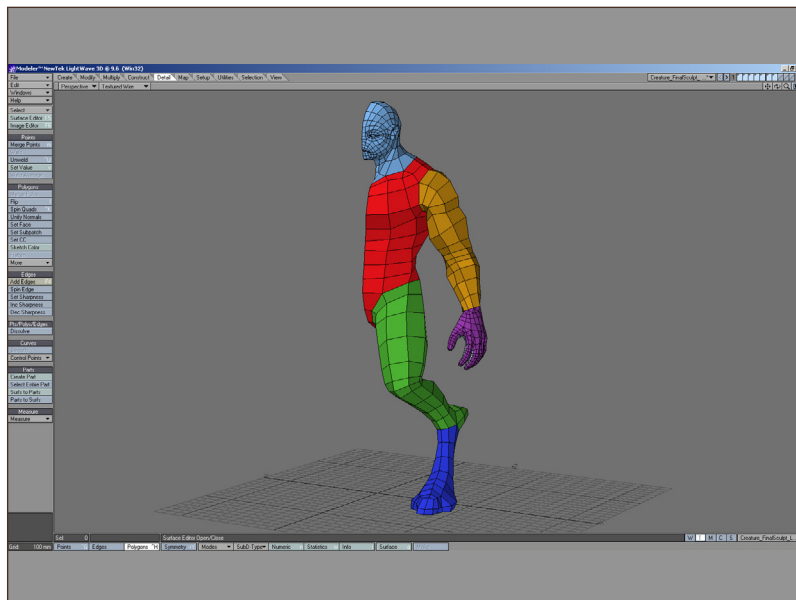
4. Select each group of polygons shown in Fig.03, and cut-and-paste them into separate layers (**Fig.04**).
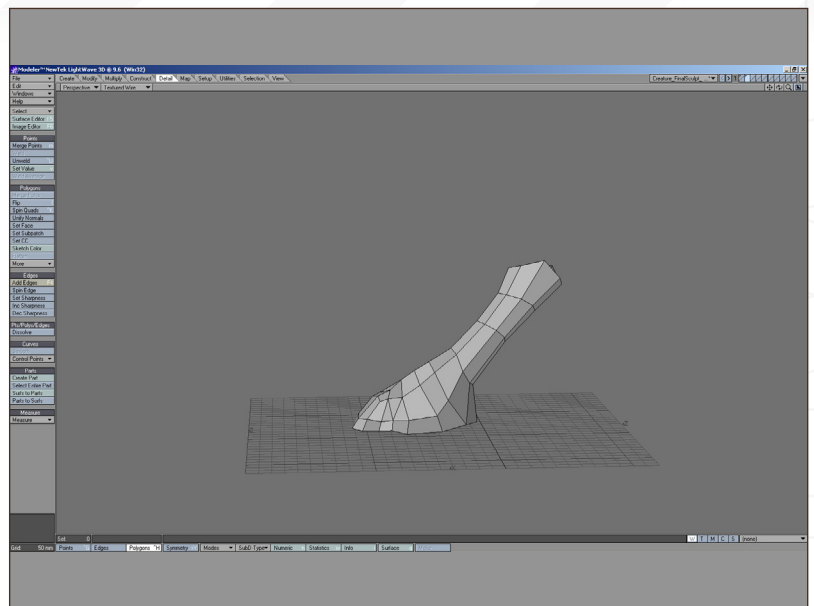
5. Pay particular attention to the way in which you divide the hands to make sure that you follow the flow of polygons around the middle of the fingers and thumb, as shown in Fig.05.
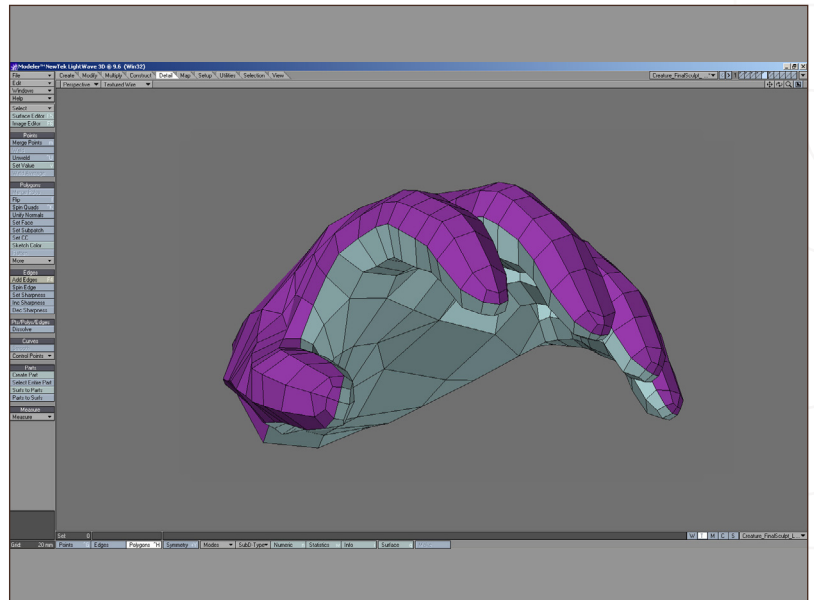
If it makes it easier to identify objects, it might be worthwhile giving each component a new surface (Q) and assigning it a different surface color – preferably something bright, as shown in **Fig.03**.

Fig 05

6. Now that we've split the character up, it's time to start UV mapping. As you can see from **Fig.06**, I've installed the PLG UV plugins and created shortcut icons for them in the Construct tab using the Edit > Edit Menu Layout command. You don't have to do this as the plugins will automatically be inserted in the Plugins > Additional drop-down menu under the Utilities tab.
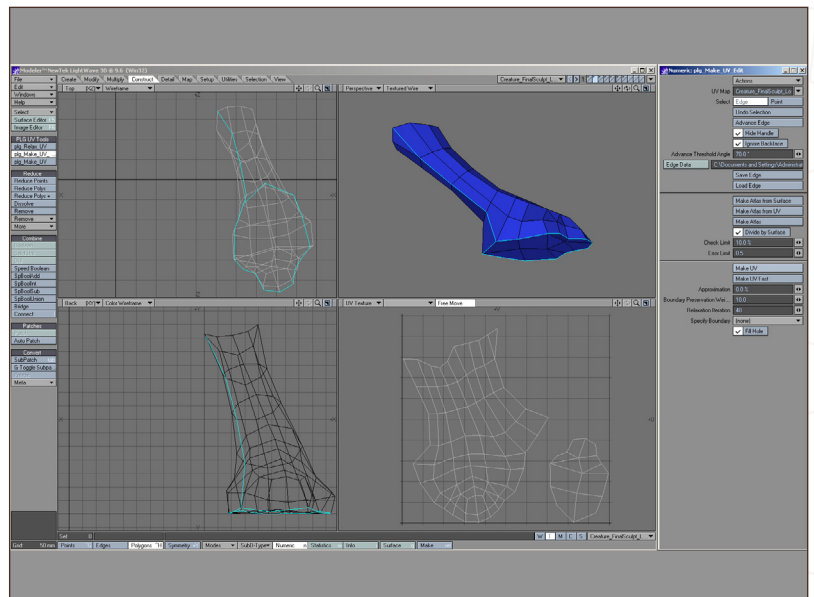
As you can see from (**Fig.06**) I've used plg_Make_UV_Edit to select the edges that will determine where the mesh is broken and unwrapped. Once selected, simply click the Make UV button and the plugin will unwrap the mesh into the perfectly formed UVs, shown in **Fig.06**. The beauty of this little plugin is that it unwraps and relaxes at the same time, so there is very little need to go in after and spend time fixing overlapping geometry. Perhaps with a high density mesh you might start to get problems, but with a low polygon object like this it's generally very accurate.

Fig 06
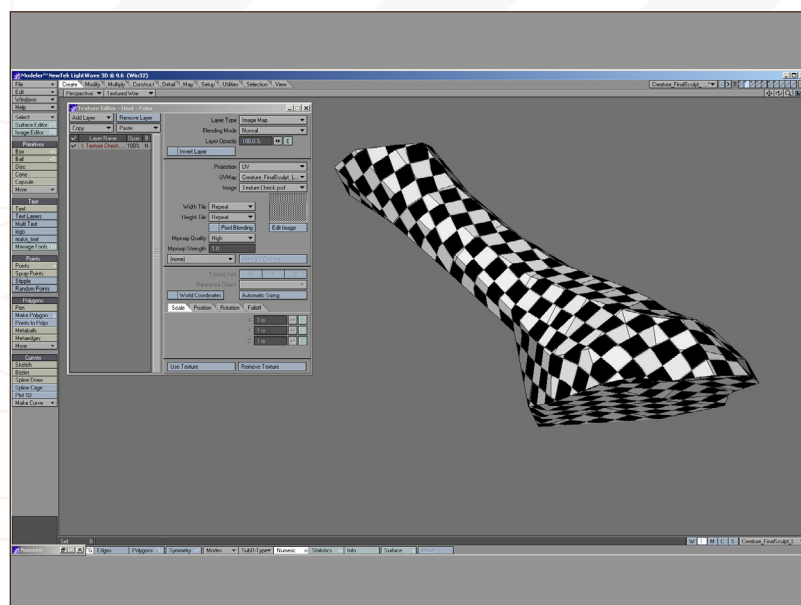
Fig 07

7. In order to check the accuracy and consistency of the unwrapped UVs, the best approach is to apply a checkerboard texture. Ideally, the squares should all be the same size, and as square as possible. As you can see here (**Fig.07**), the unwrapper has done a pretty good job of the feet.
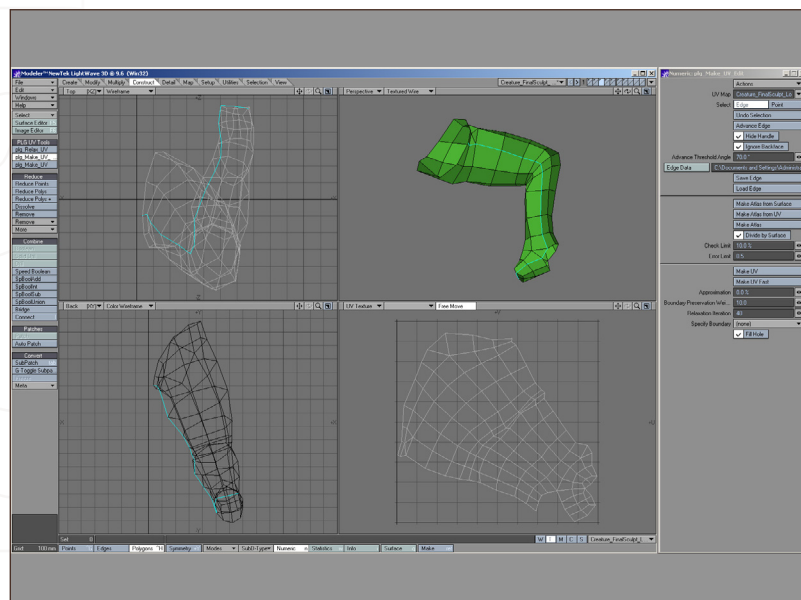
Fig 08

8. We're now going to go through the whole process again with the upper leg. Run the PLG plugin and select the edges running up the inner leg, as shown in **Fig.08**. Click the Make UV button, and that's all you need to do.
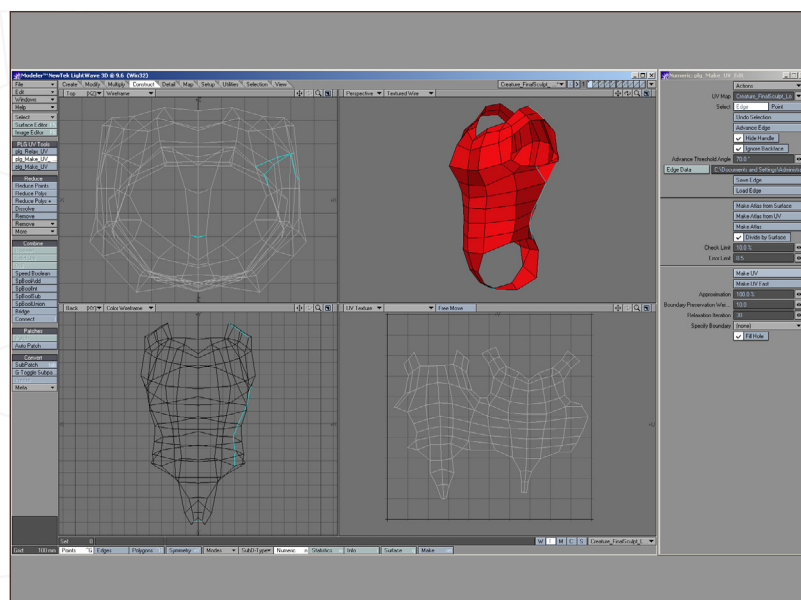
Fig 09

9. For the body, the technique is slightly different because we're going to be unwrapping it as a whole rather than just a half – it's personal taste really, but I just find it easier this way. Select the layer with the body object and use the mirror tool, Shift + V, to restore the symmetry of the body. Now use the PLG unwrap plugin, select the edges shown in **Fig.09**, and click the Make UV button. Simple!

10. Now we're going to use exactly the same technique for the arms as we did for the legs and feet. Use the PLG plugin to select the edges up the inside of the arm, and click Make UV (**Fig.10**).

Fig 10
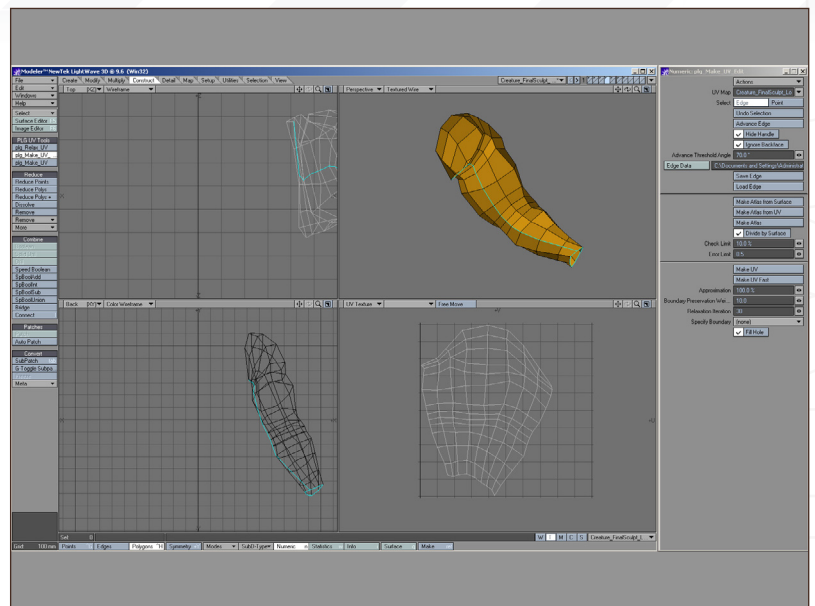
11. Unwrapping the hands is very simple thanks to the PLG plugin. Simply select the layer with the hands – top object, and press the Make UV button. There's no need to cut the hand up as the plugin will simply unwrap and relax the mesh. Do exactly the same for the hand – bottom (**Fig.11**).

Fig 11
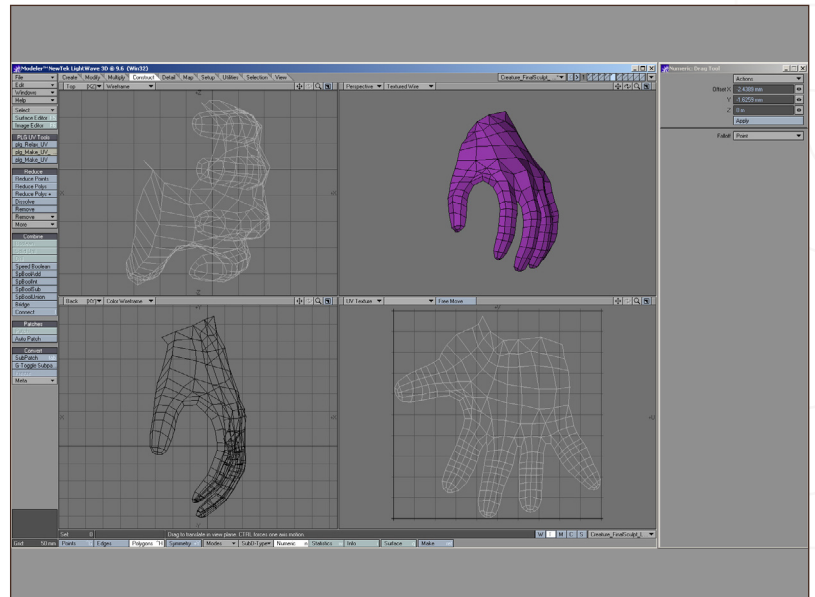
12. Now for the head! This is usually the most difficult part of the unwrapping process, but the PLG plugins are remarkably good at distortion-free unwrapping and so make this a very simple process. Like the body I've restored the symmetry of the head using the mirror tool (Shift + V). I think this gives much better results than UV-ing one side and then mirroring it and trying to stitch the UVs back together, especially since the seam would be right down the middle of the face – an area that we want to keep as accurate and distortion-free as possible. Cut the head using the plugin along the edges show in **Fig.12**, and click Make UV.

Fig 12

Fig 13

Fig 14

Fig 15
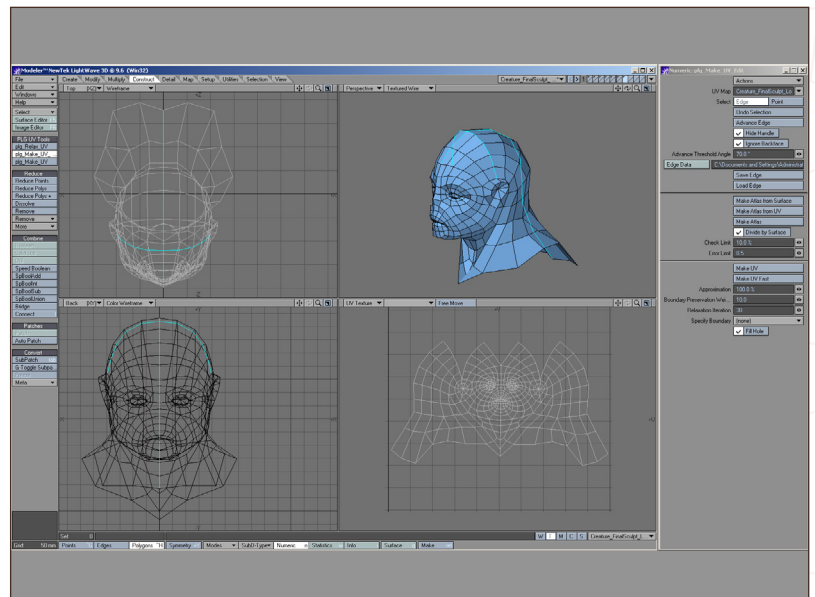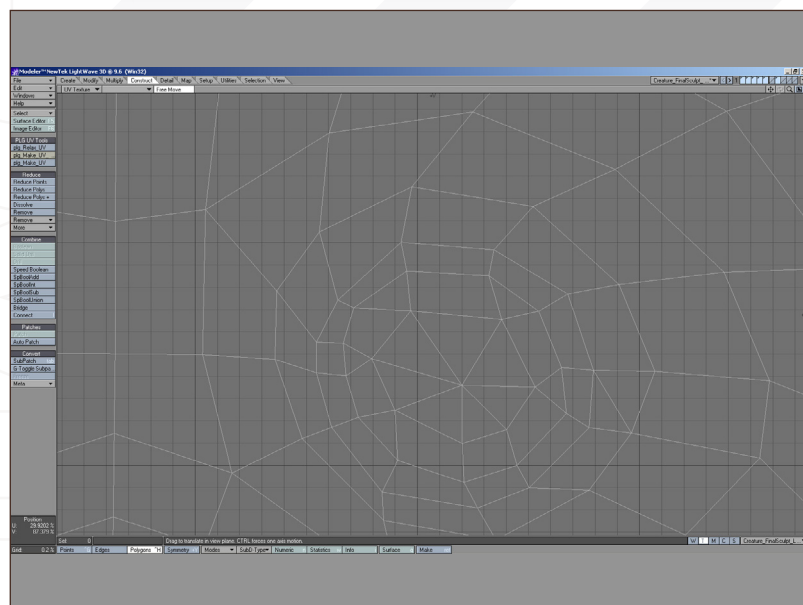
13. You should be presented with a very good set of UVs. The only area that I notice requires a little bit of attention is around the eyes. At this point, the best thing to do is to go in with the move point tool (Ctrl + T) and pull the points out a little, until they look like **Fig.13**.
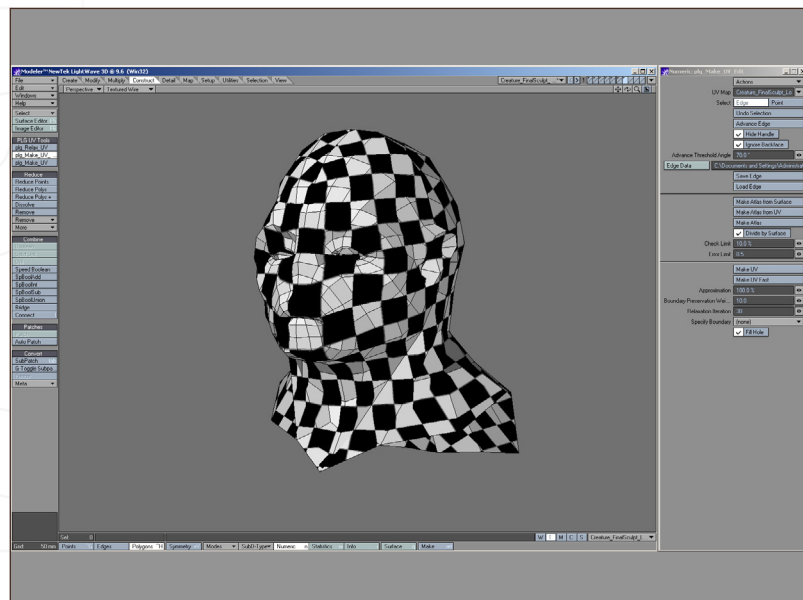
14. As before, it's a good idea to check using the checkerboard texture that the UV map is as distortion-free as possible (**Fig.14**).

15. Now it's time to restore the symmetry for the rest of the mesh. Select all the layers and use the polygon selection tool to select the arm, hands, leg, and foot objects. Now use the Mirror tool (Shift + V) to mirror the objects, making sure the centre X, Y and Z values are all set to 0 in the numeric panel (**Fig.15**).

As you can see from **Fig.15**, I've applied the checkerboard texture to all the surfaces. We can see from this that the squares are different sizes on various parts of the body. This is because when the PLG plugin makes UVs, it creates them to fill the entire UV space so there is no direct correlation between the scale of the object and the scale of the UVs. We're going to correct this by hand.
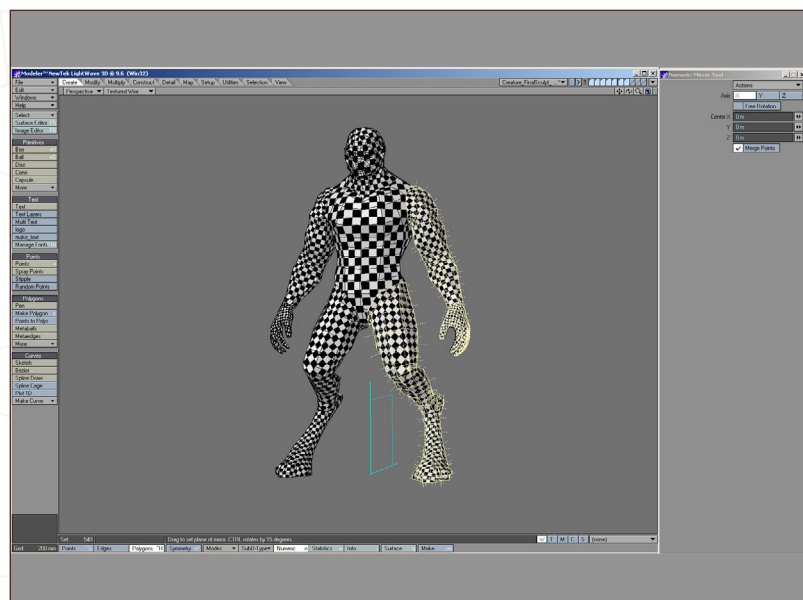
16. As you will remember, we made the UVs for the arms, hands, legs and feet for only one side of the character, and then mirrored them across at the end. The result of this is that both sides have exactly the same UVs occupying the same space. So we must separate these before we do anything else.

Start with the feet (**Fig.16**): select the foot on the right using the polygon selection tool. Then use the move tool in the UV window to move the UVs from on top of one another. It's very simple. Now you need to repeat this process for the legs, hands and arms. At this point it doesn't matter about their position within the UV grid, just as along as all the objects have separate UVs.

17. Now we can begin packing the UVs. It's worth keeping an eye on the checkerboard texture and trying to keep all the squares a uniform size. As you can see from my example (**Fig.17**), the squares on the head are slightly smaller, and this is because I've made the head larger on the UV grid, giving it a slightly higher resolution compared to the rest of the body. This is particularly important considering that a lot of the fine details sculpted in ZBrush are in and around the face, and it will therefore benefit from having more resolution on the exported displacement map. Try to layout your UVs in a similar fashion to the ones shown here; if you want it to be exactly the same you could Print Screen (**Fig.17**), set it as the backdrop in the UV window, and then simply match your own UVs to mine.

Here we have the Final UV character with the checkerboard texture (**Fig.18**).

Our character is now well on its way to being brought to life. It has been modeled, sculpted, and now unwrapped. Unwrapping can be a tricky business and may seem somewhat uncreative and monotonous, but like any craft, there are parts that just need to be done, and done well, to enable the next phase to run smoothly. I hope that you've learned that it need not be as complex as it seems. An unwrapped model can be heaven or hell for texture artists, and it's an extremely important skill to learn for life in the games industry!

Creature Concept by: Richard Tilbury
Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by James Busby for LightWave

Tutorial by:

JAMES BUSBY

For more from this artist visit:

http://www.ten24.info

Or contact them:

jamie@ten24.info

Fig 16

Fig 17

Fig 18

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MAYA

NEXT GEN
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This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

CHAPTER 4 – MAPPING / UNWRAPPING

This part of the tutorial will focus on a vital part of the pipeline in readiness for the texturing phase, namely the mapping and unwrapping. It will provide an insight into various approaches to mapping and show how to go about exporting a wireframe template to be used as a guide in preparation for the next chapter.

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CHAPTER 4 - MAPPING / UNWRAPPING

Software Used: Maya

Welcome back to our character creation series. After the last two months' of ZBrush sculpting we are on the home straight and our finished character is within sight. This month we will be concentrating on a vital part of the process: unwrapping.

Unwrapping, or UV mapping, is the process of splitting your mesh up into parts that are then flattened and arranged ready to be painted on. There are many methods to unwrap a mesh; I am going to show you my usual workflow when using Maya.

1. Export your lowest iteration of the model from ZBrush. Although we imported our own when we started the sculpting process, the mesh might have changed slightly, so importing our base subdivision level from ZBrush will ensure we have our latest version and will be more accurate in general. We can also further adjust the mesh to fit the high-poly, now that we know which areas need modifications.

I push and pull vertices to give the low-poly model the same volume as the high-poly model – or as close as possible. For example, we
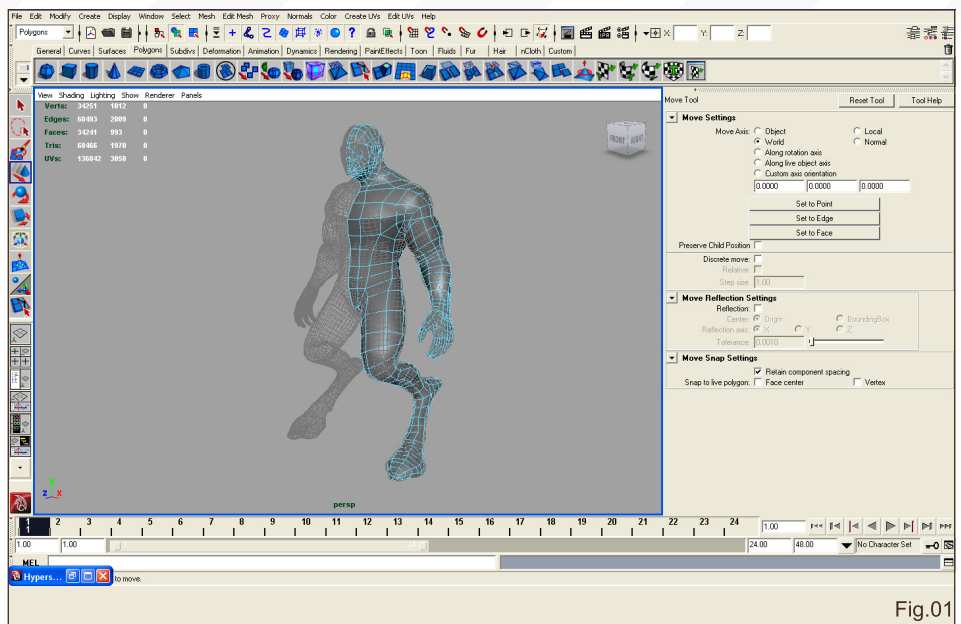
Fig.01

beefed up the character's arms and chest, but lose that definition in the low-poly model, so just quickly pulling out the vertices in those areas will help us out later on when we bake our maps.

I've brought in a higher density version of our character to compare shapes with – as you can see, the two meshes are fairly close together (**Fig.01**).

2. This character is fairly symmetrical, so we can focus on unwrapping just one half of the character and adjust it later on when we stitch the model back together. I have left the right side of the character (the character's left-hand side).

When deleting faces on the left-hand side, be sure that you don't grab any faces that reach beyond the X-axis – areas such as the mouth have a higher concentration of polygons, and selecting smaller polygons by mistake can be fairly easy in this case.

Before I even begin unwrapping, I set up a quick checkerboard texture. Since the checkers will be square, it helps me spot areas that will be stretching, and also helps me judge pixel density through the model. Go to Window > Rendering Editors > Hypershade, and click on a shader ball to create it.

For modeling, I usually use Blinn materials, but in this case a Lambert will work just as good since I won't need highlights or more complex shading information. With your model selected right-click over the lambert shader ball you created and assign the material to your model. Now when you click on the shader and go to its properties menu, you can click on the checkered tile next to Color. This shows you a new menu with various options – select Checker. Once this has been assigned, your model will look strange. This is because the checker material is applied to it, but since the UVs on the character model are incorrect, they will not be displayed properly. Click the "place2dTexture" tab to
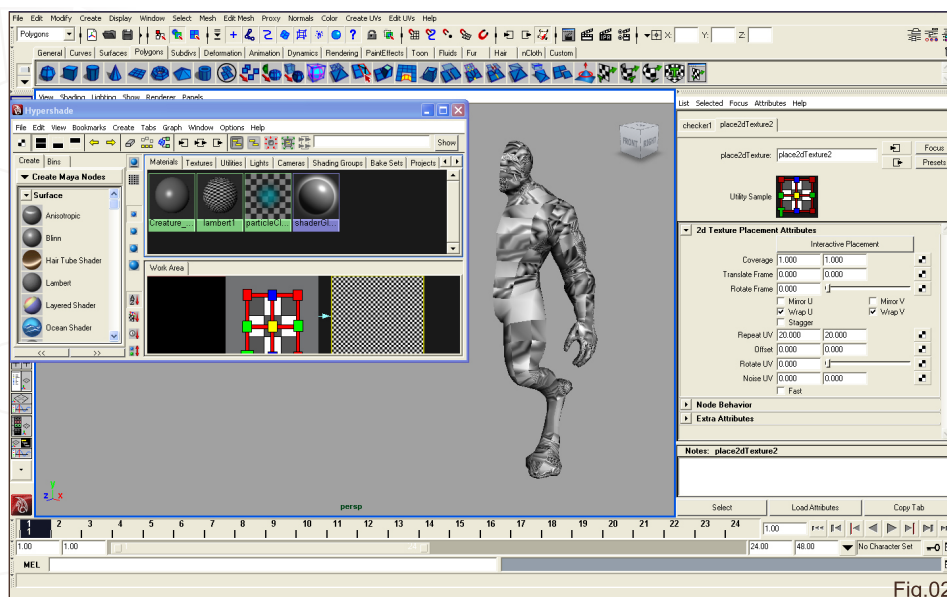
Fig.02

the right and set both of the repeat UV values to something like 20 – just make sure both numbers are the same if you want the checkers to be square (**Fig.02**).

3. Now that the material is ready I'm going to start unwrapping the character. I like to start from the head and work down. Select all of the polygons in the head, and in the Polygons UI select Create UVs > Create UVs based on Camera, making sure that your camera is as front-aligned as possible. Now you can view your character's UVs by selecting Window > UV Texture Editor.

With the UVs of your character's head selected, select Polygons > Unfold (Options). These options – which we will be utilizing throughout this process along with planar projections and a few other neat tricks in Maya – give you the ability to automatically unwrap your object with very few errors.

As you can see in the options provided, we can choose to Pin UVs, which essentially tells Maya not to distort the UVs in the unfold process. By default, I usually Have Pin UVs > Pin unselected UVs checked. Go ahead and click Apply. You'll quickly see the UVs change in the UV Editor, and in the viewport the character's head should now be covered in fairly evenly distributed checkers (you may need to enable High Quality mode to see this properly, depending on your video card – simply click Renderer > High Quality Mode) (**Fig.03**).

4. There will be a tiny bit of stretching around the top of the head. We can manually edit these areas in the UV Texture Editor window. Right-click over the window and you will notice a menu appears giving you different selection methods. Click UV. Note: With other selections made, such as vertices, you can press CTRL + right-click to bring up a list of options that allows you to convert selections into different types; for example, Vertices <-> UV.

Fig 03

Fig 04

Fig 05

Fig 06

Fig 07

Fig 08
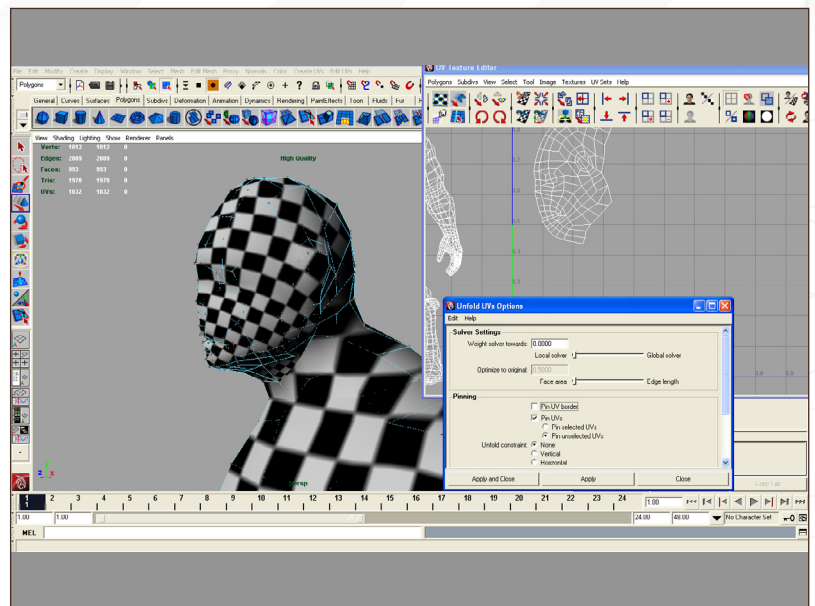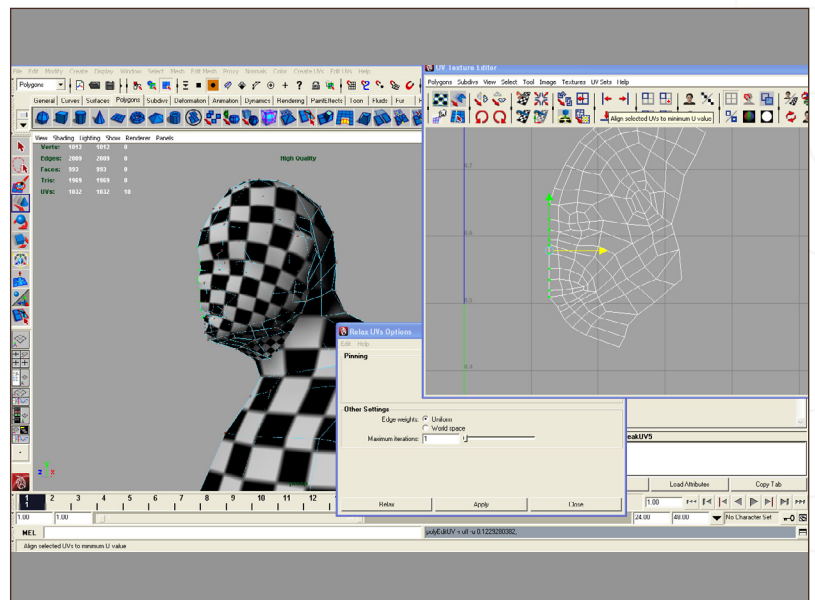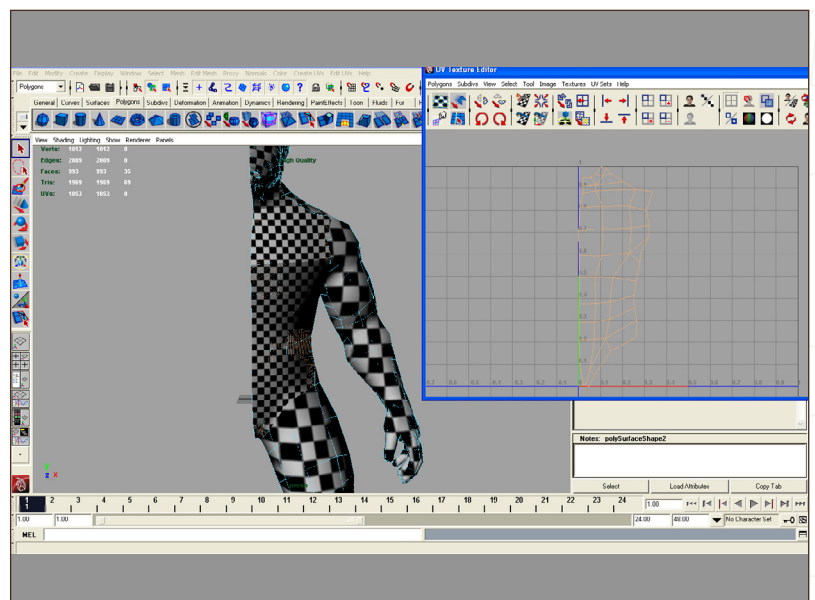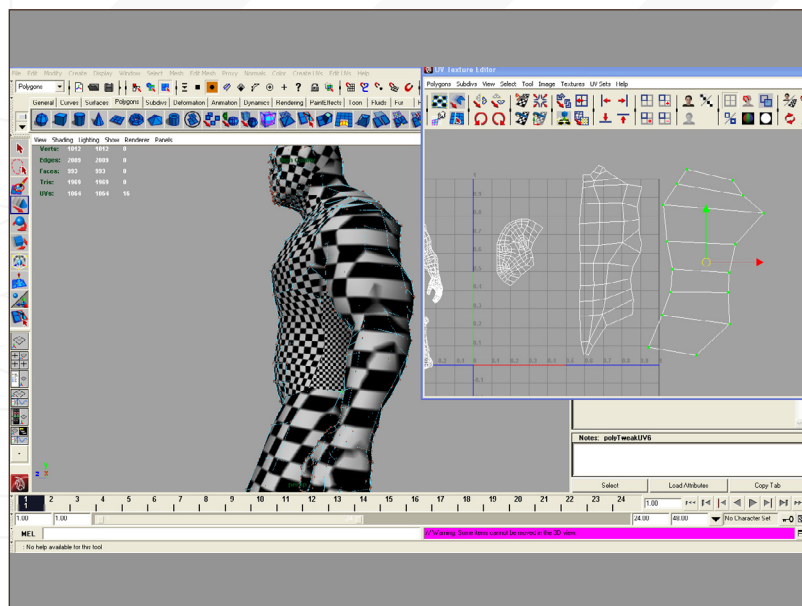
Now, just like in the 3D viewport, you can press W for Transform, E for Rotate and R for Scale. With the problem areas selected, simply move them around the UV texture editor until the squares become more even on your 3D model. Keeping in mind that we will be mirroring this model and thus flipping its UVs in the future, try to plan for seams or where the two halves will be stitched as best as is possible. In this case, I would try to make the center of the head's UVs as straight as possible to cause less distortion when the two halves are combined. A quick way to do this, with your chosen UVs selected, is to click the "Align Selected UVs…" buttons towards the top of the UV editor. This gives you the option of instantly aligning all selected UVs to the maximum/minimum vertical or horizontal positions (**Fig.04**).
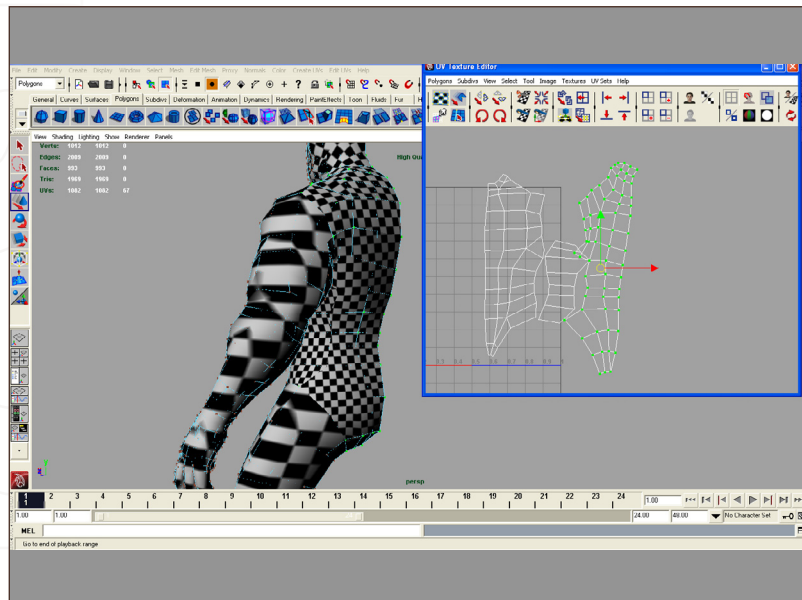
5. Next we are going to move on to the torso, using the same methods as above. Much like the head, we will want the center of the model on the side of the chest to be fairly straight, as this will be our welding point. With the polygons selected that make up the chest area (basically anything from the neck to the crotch), select Create UVs > Create UVs based on Camera, again while being in the Front viewport, or close to it in the Perspective viewport. There will be some stretching around the side of the ribs; you can simply pull those out in the UV Texture Editor to fix the problem (**Fig.05**).
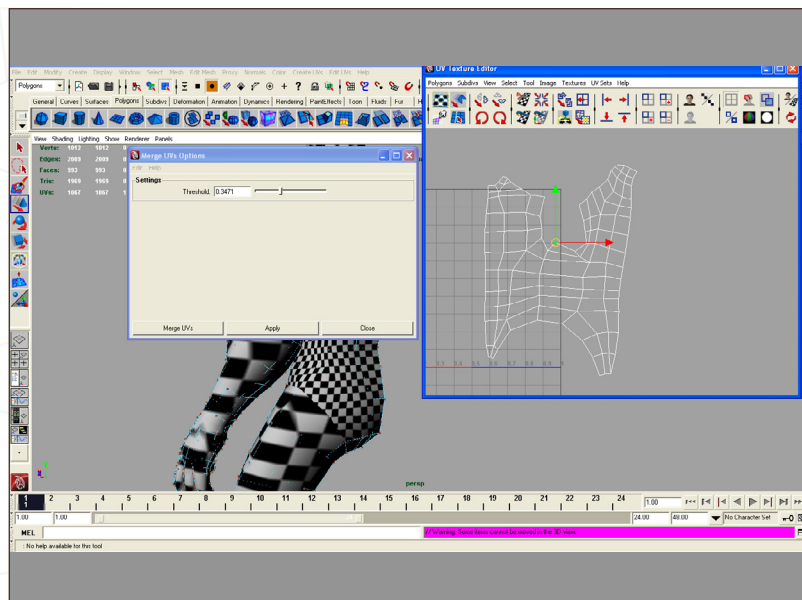
6. Select the polygons that run from under the armpit down to the waist, and repeat the process in step 5, creating the UVs based on camera, but this time make sure your viewport is at more of a profile angle. If your UV islands are starting to become crowded, just rearrange them as needed and we will optimize their positions later on as we finalize our UV layout (**Fig.06**).

7. Now select the polygons that will make up the back and, much like in step 5; create a projection based on the camera angle, only this time have the back fairly straight on in the shot. The outer edges of the back UV island don't

necessarily need to be straight as this will be our UV seam, although it should be kept fairly neat to make the texturing process easier (**Fig.07**).

8. To weld the UVs together, click Polygons in the UV Texture Editor and scroll down to Merge UV (Options). The dialogue box that appears will allow you to set the threshold of the merge function – basically how far Maya will search for UVs to weld together. As a note, Maya will only merge UVs that have welded vertex counterparts. So, if the vertices are welded together in 3D space, the UV points that represent them should also weld together just fine. With the UVs selected, click Merge UVs (**Fig.08**).
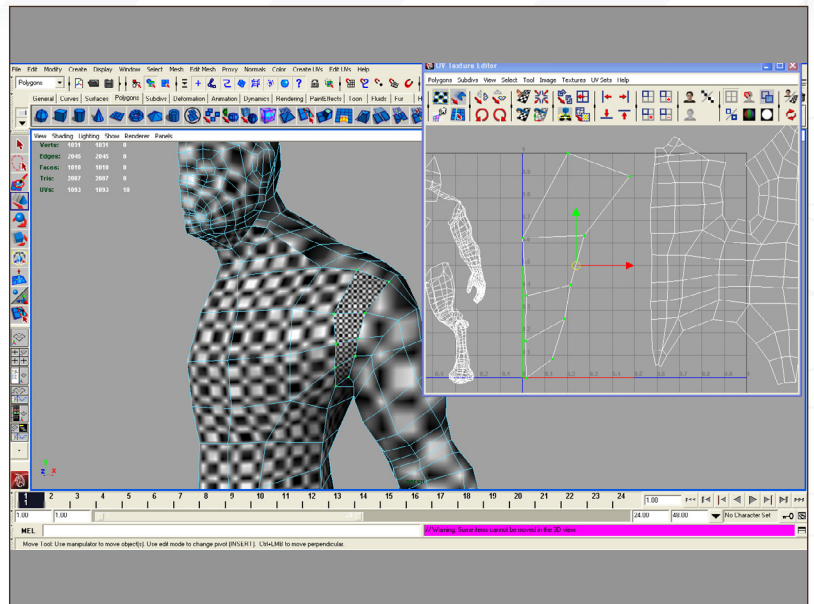
9. Having noticed that I missed a few polygons on the chest, I made another projection for them (**Fig.09a**) and welded the UVs using the steps mentioned earlier (**Fig.09b**).

Fig 09a

Fig 09b
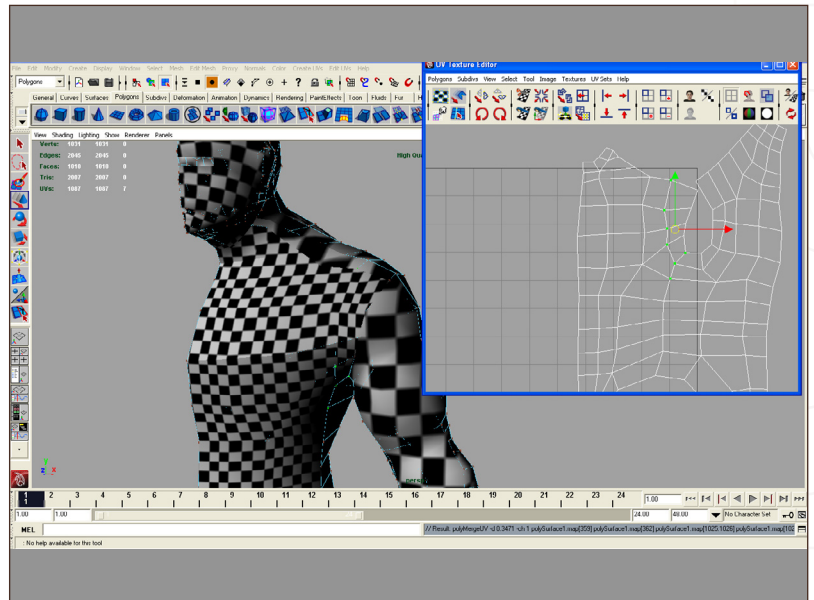
10. To finish off the torso UVs, I've selected the polygons that run between the head and the shoulder and make projections for them based on the camera angle – basically one strip of faces/UVs for each side of the torso (**Fig.10**).

Fig 10
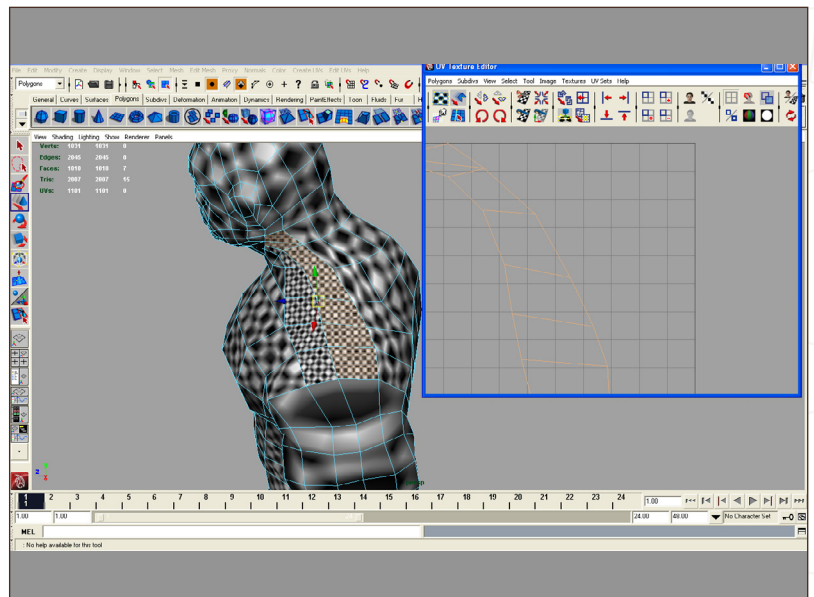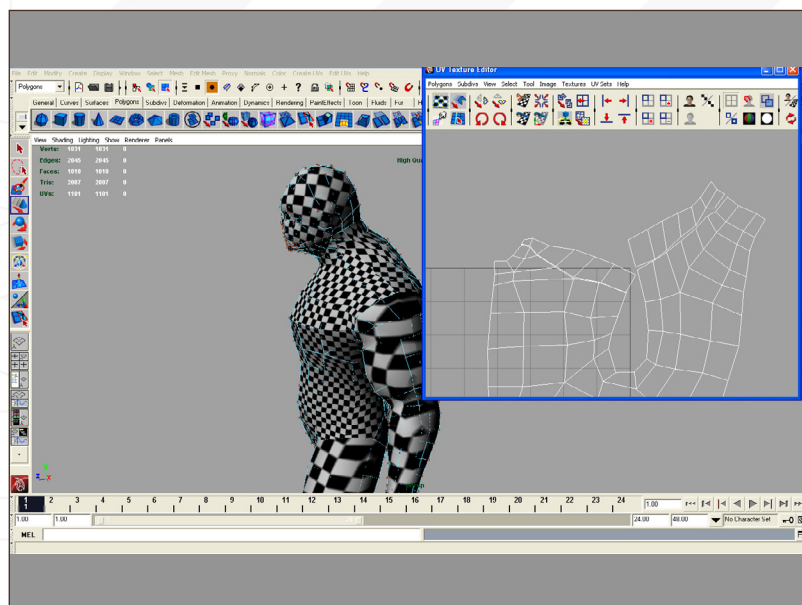
Fig 11a

11. Once done, I move the strips closer to the respective side (chest or back, keeping the seam running down the middle) and weld these sections to the main UV island of the torso (**Fig.11a – b**).
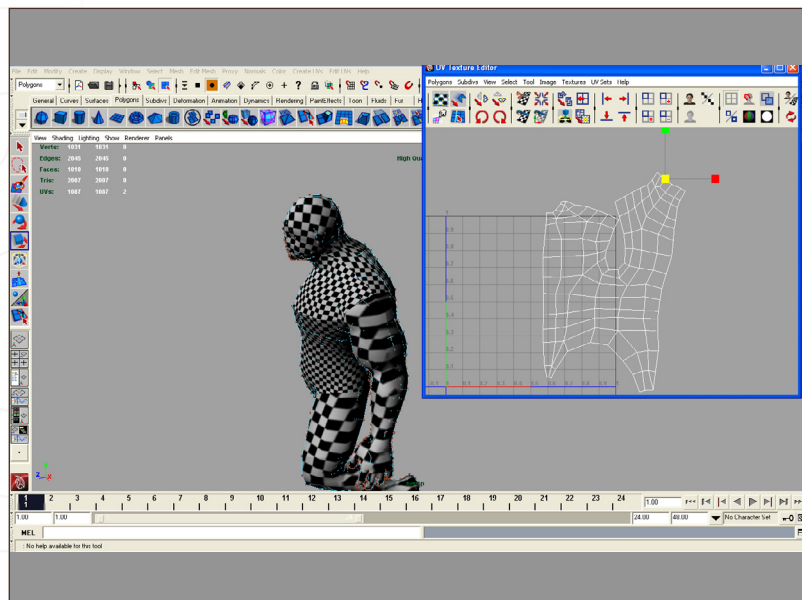
Fig 11b
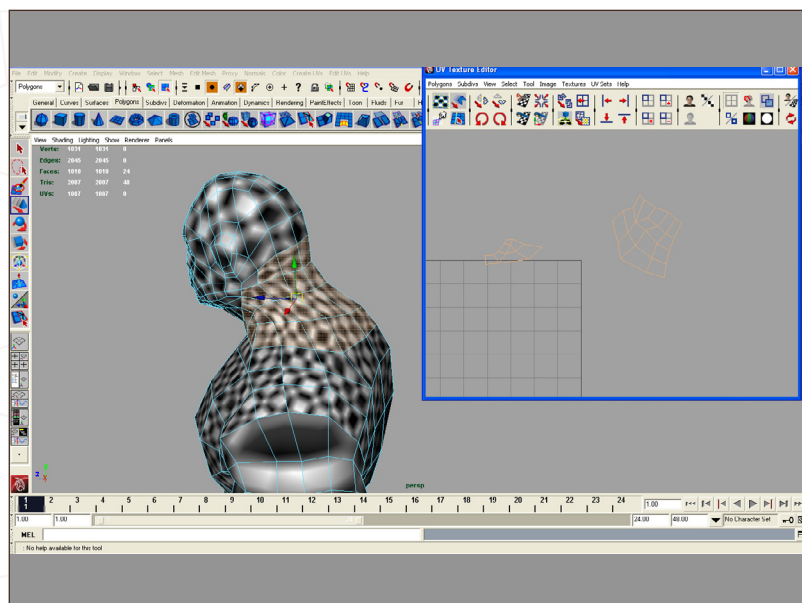
Fig 12a

12. At this stage, I'm realizing that my UVs are becoming hard to manage in the neck area using this setup. To correct this situation, I take the faces in the trouble area and split them using the Split UVs function located under the Polygons menu. This unwelds the selected UVs and allows you to move them freely, making it easier to reposition them and attach them to a different section (**Fig.12a – b**).

Fig 12b
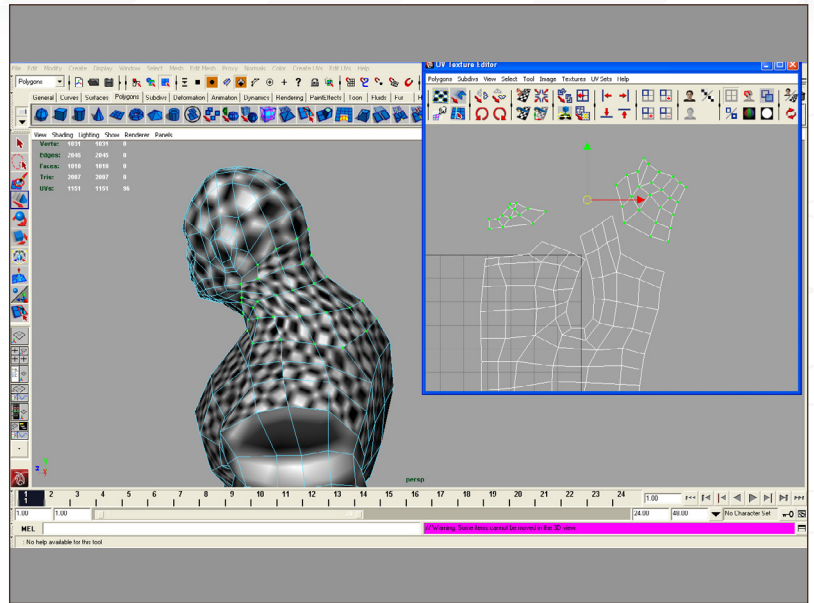
13. In this case, I am going to weld them to the head UV island that was created earlier. This will take some manual readjusting to reduce the amount of distortion. Try to keep the squares on the checkerboard texture "square", and roughly the same size. Once the UVs have been tweaked, just like in earlier steps, select the UVs and weld them together.
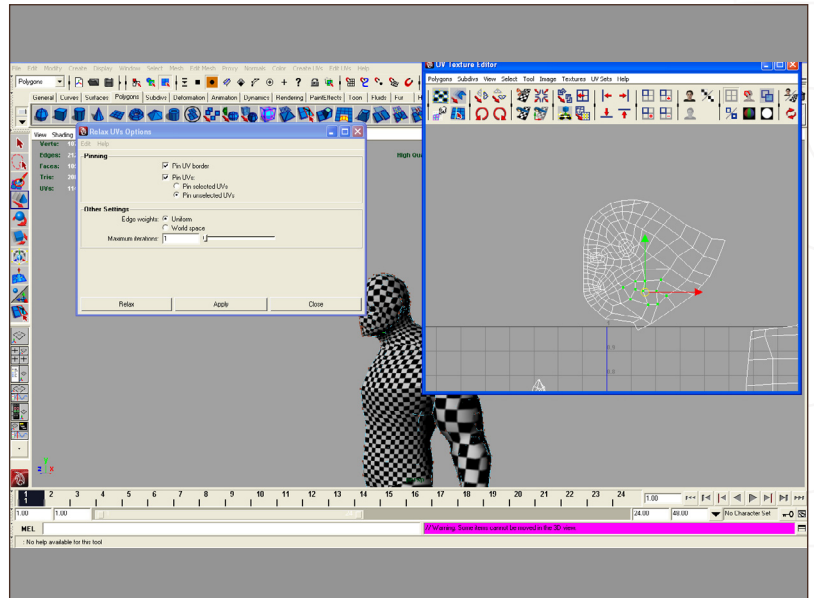
Another handy UV tool that Maya has is the Relax feature. This can be found under Polygons in the UV editor. Basically, this acts the Average Vertices feature, allowing you to smooth out the UVs in the selected area rather than manually tweaking each UV one by one.

With the Pin Unselected UVs option checked (this keeps all unselected UVs where they are, unaffected by Relax), I ran Relax at the lowest iteration possible (**Fig.13**).
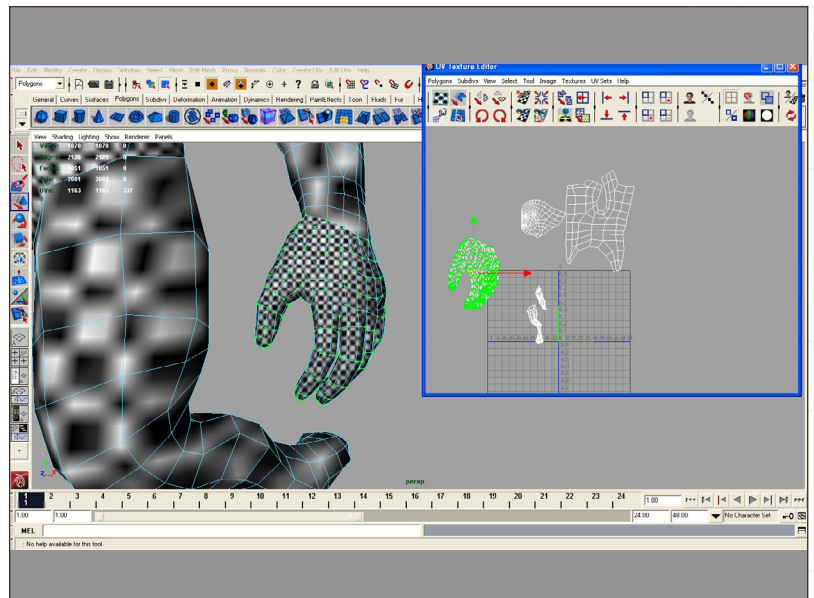
14. Moving onto the arm now, I find that it is best to split the hand away from the arm itself, in regards to the UVs, since it is easier to manage this way. With the polygons of the hand selected in the 3D view, simply create a projection for it, like in previous steps, and move it out of our working space (**Fig.14**).

Fig 13

Fig 14
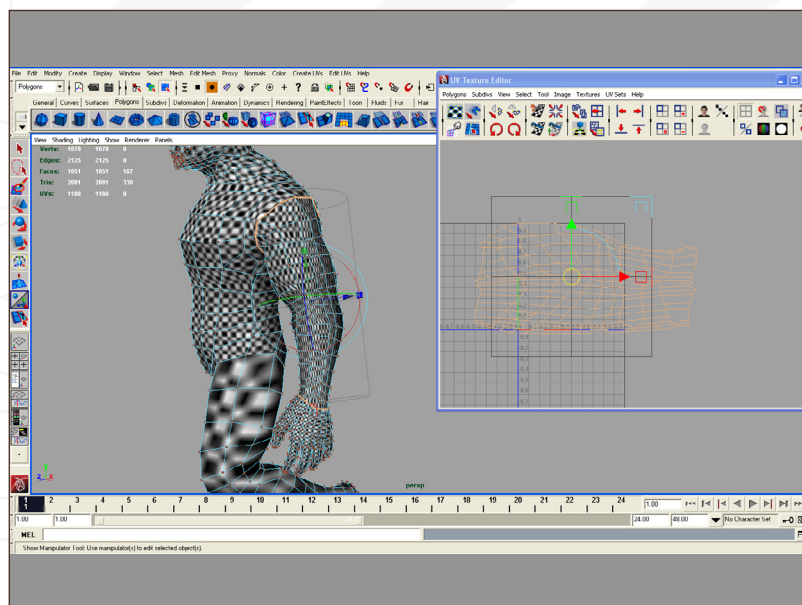
Fig 15

15. The arm itself is a fairly cylindrical shape that can be handled with a cylindrical projection rather than a series of planar projections. With the polygons of the arm selected, click on Create UVs and scroll down to Cylindrical Projection. Once you do this, you will notice an implicit cylinder appears around the polygons you specified. Towards the bottom of this projection there appears to be a small red "T". Click on that and you will notice the gizmo in the center of the projection changes. Click the circle shape in the center of the projection, which actives the projection rotations, and rotate the projection so that it runs roughly along the arm. You'll notice that, in the UV editor window, the arm UVs will also be updating as you rotate the projection around. Try to get it so that the inner edge of the arm (the one that runs from the armpit to the palm of the hand) is our UV seam (**Fig.15**).
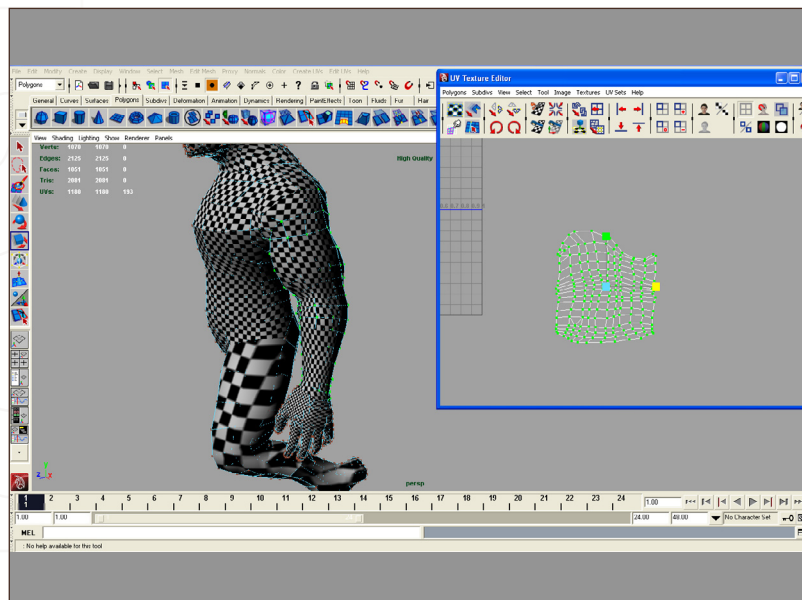
Fig 16

16. Now, obviously, the scaling for the UVs is off. Grab all of the arm's UVs and enter Scale mode by pressing R. Scale the UVs on the X-axis until the checkers become fairly square on your model (**Fig.16**).
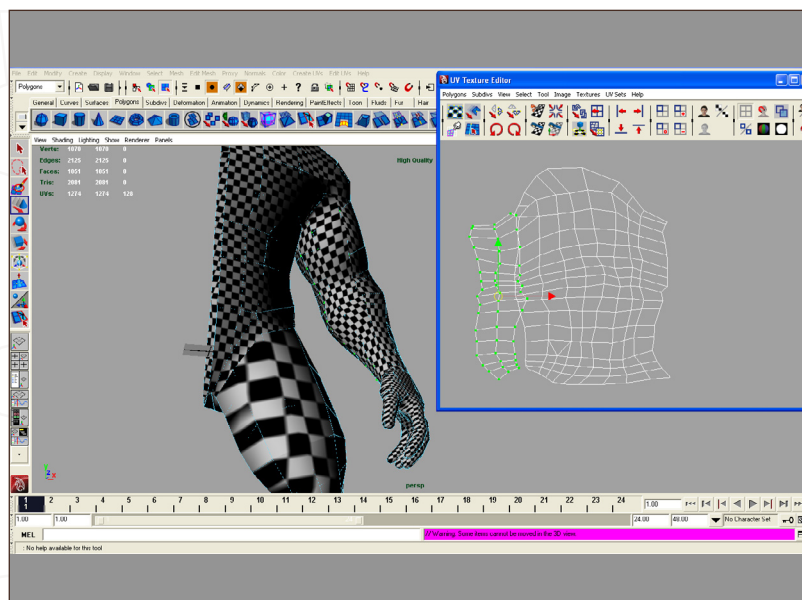
Fig 17a

17. If you were unable to create the UV seam at the inner arm, don't worry. Just select the polygons in your UV editor – probably a few rows at the left or right edges – and use the Split UVs function, as mentioned in earlier steps. Once you do this you will now have a separate UV island that you can move to a better location that will create the UV seam near the inner arm. Once this is done, Merge the UVs and manually tweak the UVs to reduce stretching near the elbow and the shoulder (**Fig.17a – b**).

Fig 17b
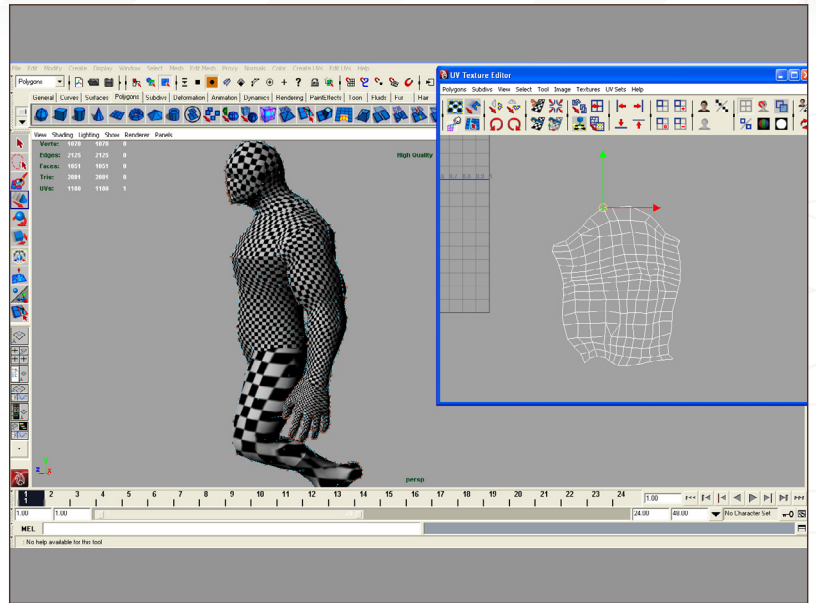
18. Moving onto the hand, select the polygons that create the palm, favoring the seam to be closer to the palm rather than in the center of the fingers. With the polygons selected, position the camera to be facing the palm of the hand and create a projection based on the camera angle, just like in previous steps. Then do the same for the back of the hand, which will basically be all of the other polygons in the hand (**Fig.18a – c**).

Fig 18a
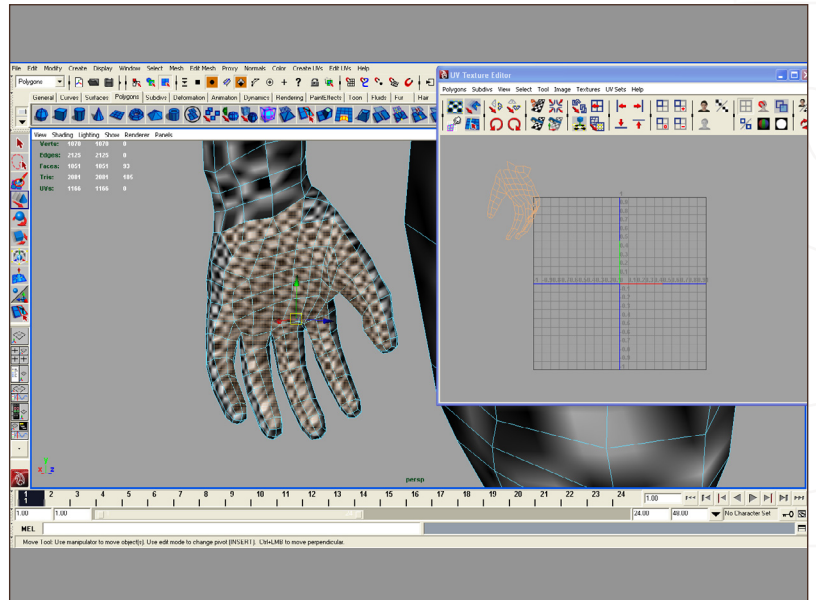
Fig 18b
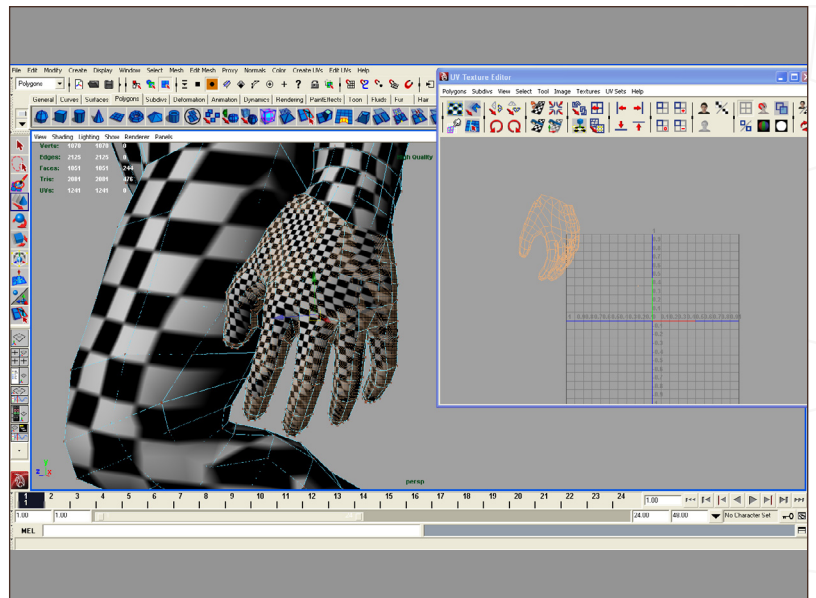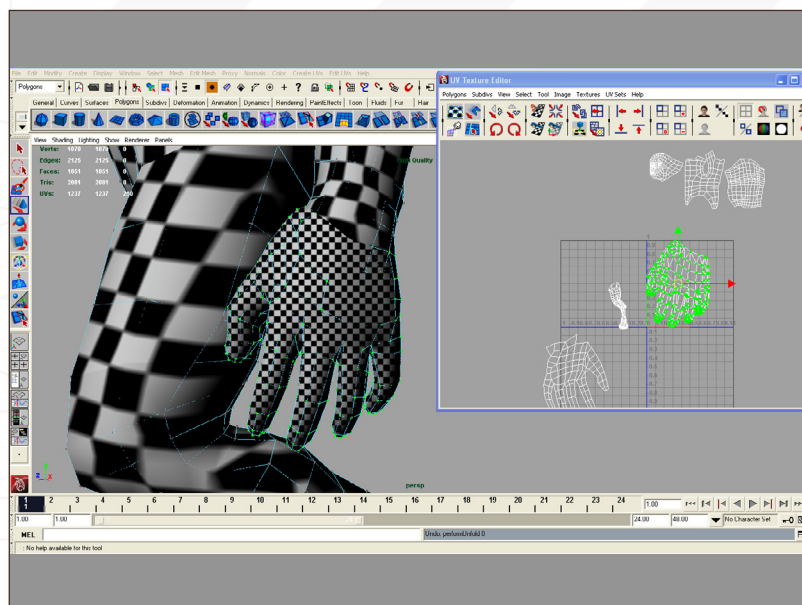
Fig 18c
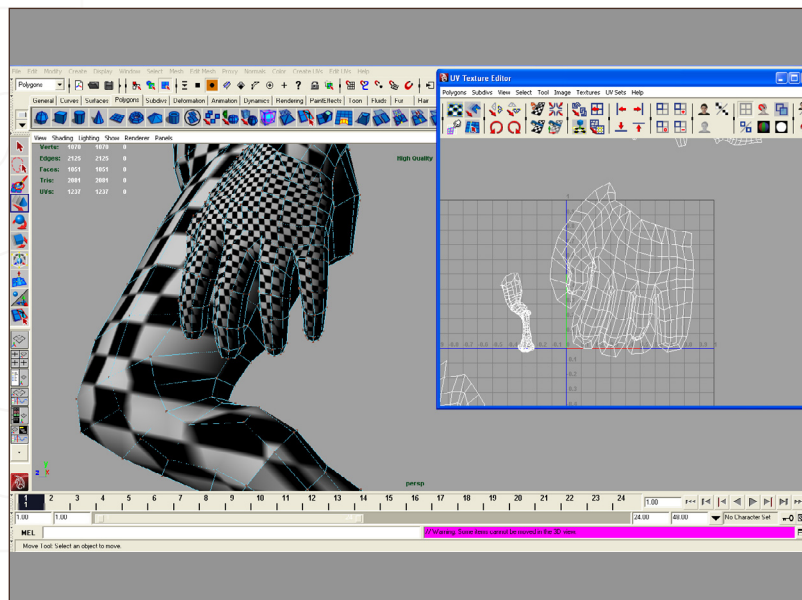
Fig 19a

19. Selecting the outer UVs on the back of the hand, bring them out manually using the Move tool. You may have to grab sections of the fingers and rotate or move them to give yourself some space, which is fine. Once this is done, grab each UV, starting from the outside and working in, to flatten out the UVs. The end result should have the fingers spread apart and fanned out. Select all of the UVs in the UV island of the palm that we just created and move/rotate/scale them so that the edge of the outer hand roughly lines up. Once this is done, merge the UVs in this area to get rid of the UV seam. This will now leave us with a UV seam that runs along the palm and the outside of the thumb (**Fig.19a – d**).
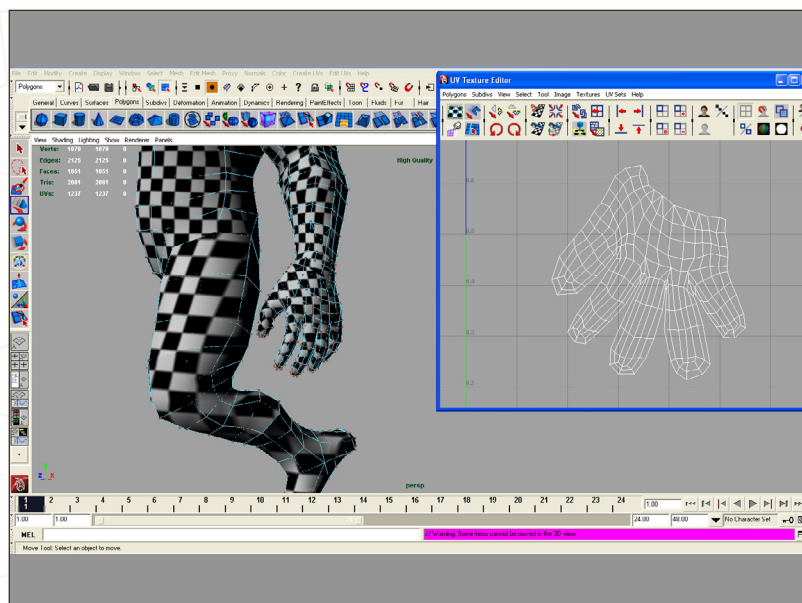
Fig 19b

Fig 19c
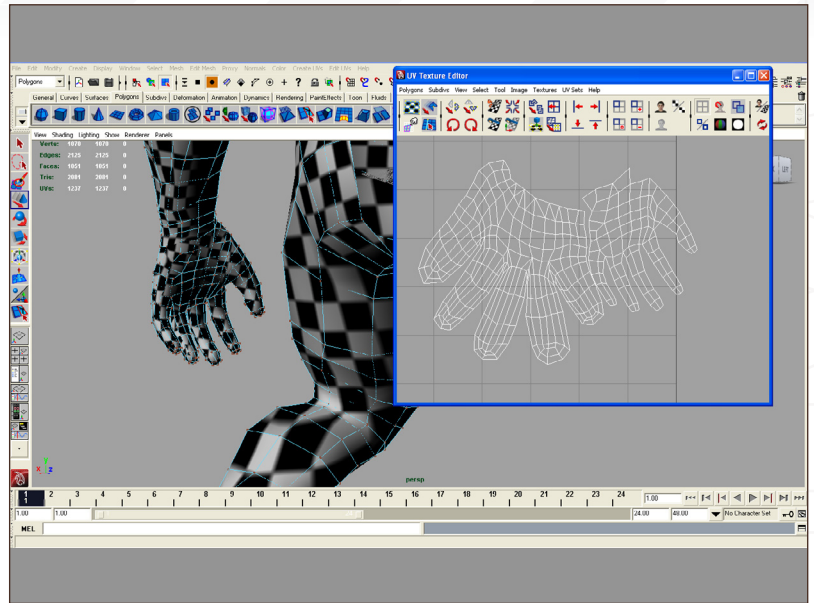
Fig 19d
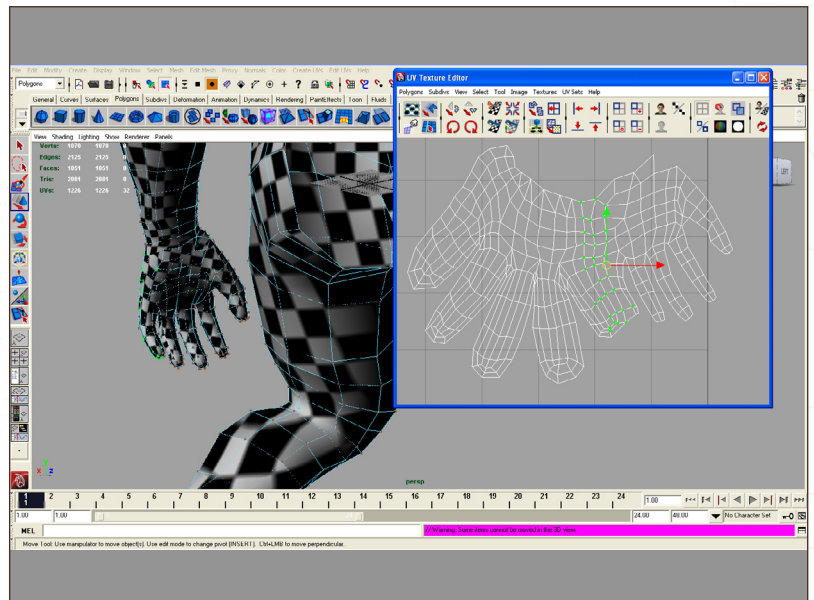
20. Moving onto the leg, the best way to tackle it, like the arm, is to dissect it into chunks that will make the section easier to manage. I start by selecting the polygons on the bottom of the foot and creating a projection based on the camera angle, with the camera looking at the bottom of the foot. I've also selected the "knee", created a planar projection and then relaxed it a few times using the Relax tool. I then Split UVs to alleviate some of the stress that this shape was creating – basically, with the entire UV island as one consecutive piece, a lot of distortion was being caused. Adding a split allows more space to readjust the UVs and reduce the amount of distortion (**Fig.20a – c**).

Fig 20a
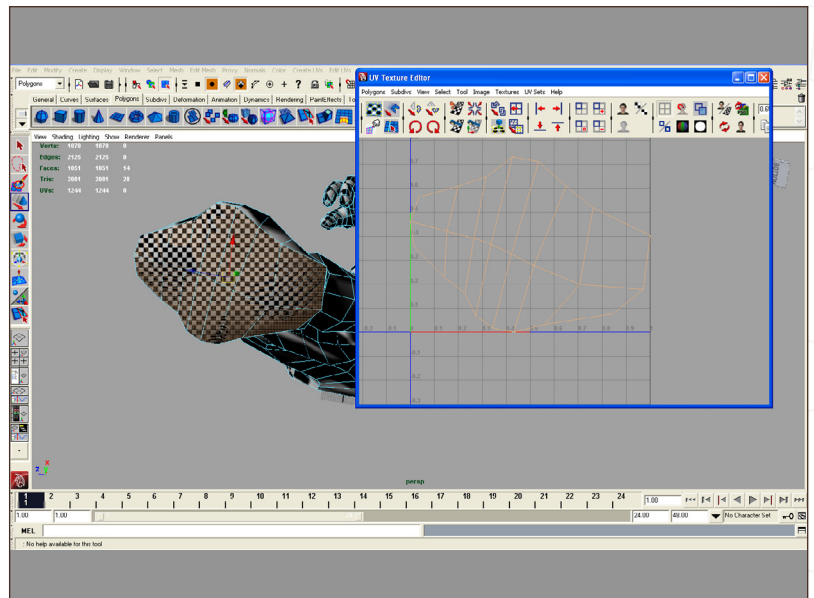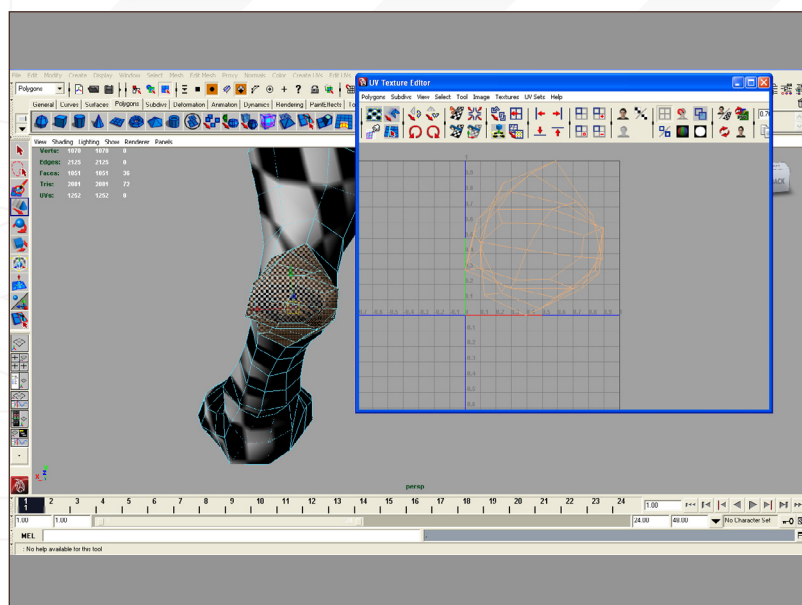
Fig 20b
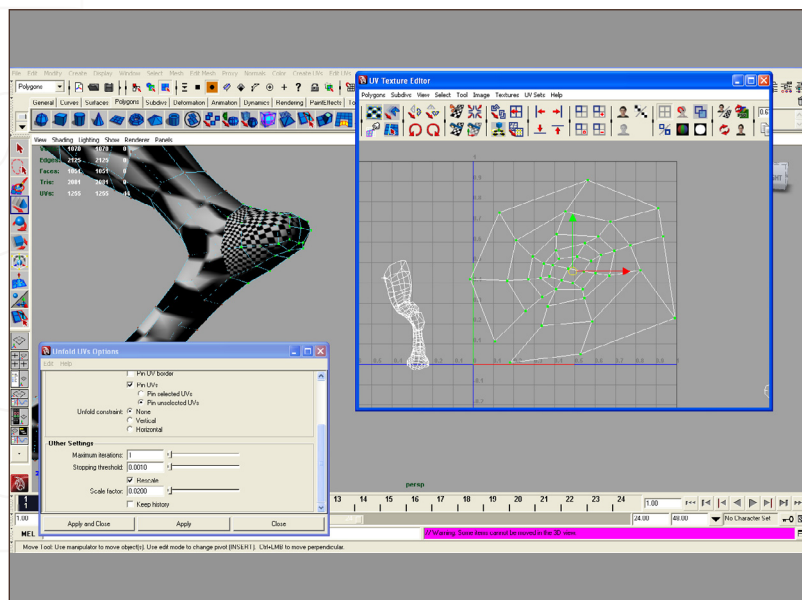
Fig 20c
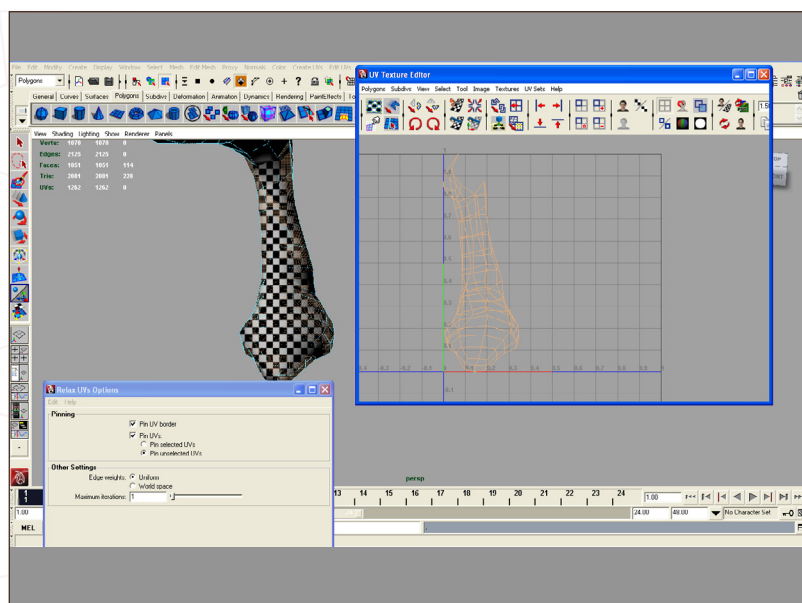
Fig 21a

21. To unwrap the lower leg, I find using a series of planar projections, like in previous steps, works best. I used three planes, more or less moving the camera to the front, left and right, creating a projection based on those camera angles.

Once the planes are projected into UV space, arrange them so that their borders are aligned, and then merge UVs. Just be sure to keep the seam near the inner leg as this is the area most hidden from view, making the seam easier to hide (**Fig.21a – d**).

Fig 21b
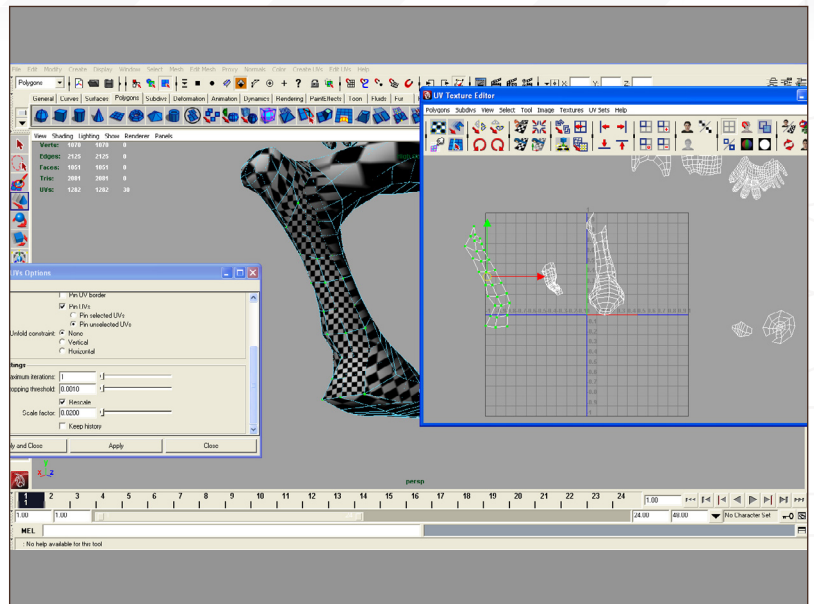
Fig 21c
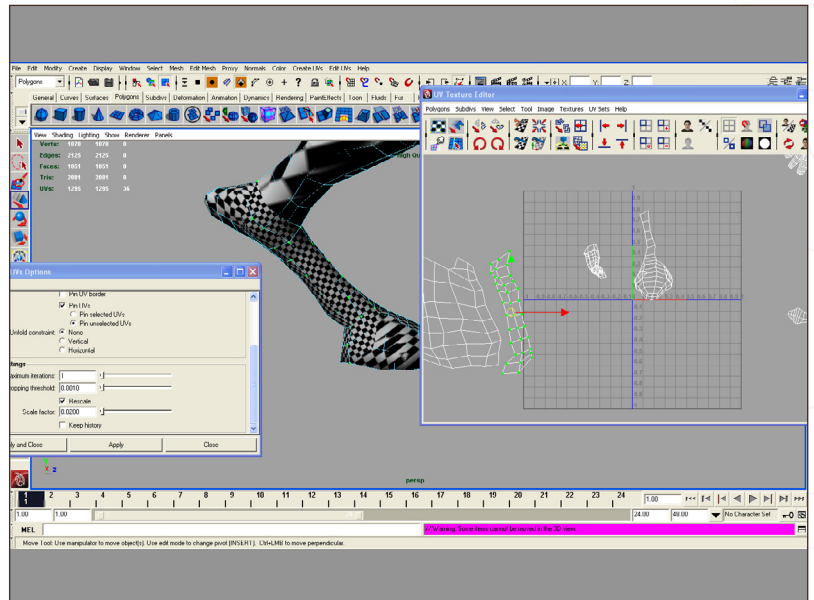
Fig 21d
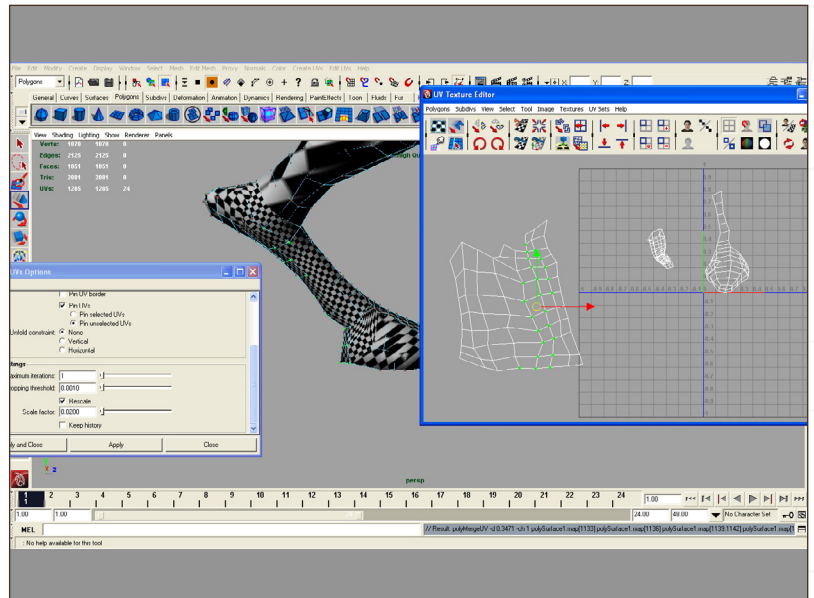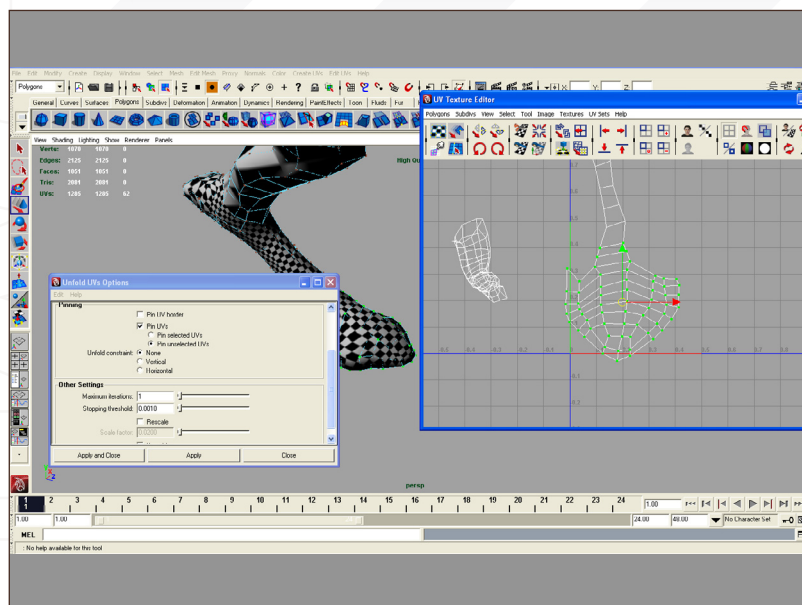
Fig 22

22. For the foot, treat it like the hands. Take the outer UVs and spread them away from the foot itself, leaving room to distribute the next few rows of UVs (**Fig.22**).
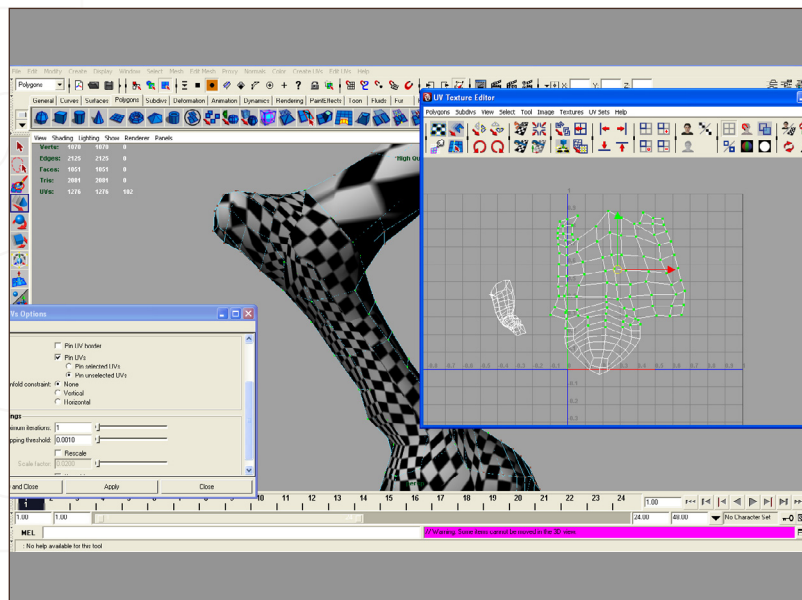
Fig 23

23. Take the left and right projections of the lower leg that we created and merge them to the front projection; the section that will have the foot connected to it (**Fig.23**).
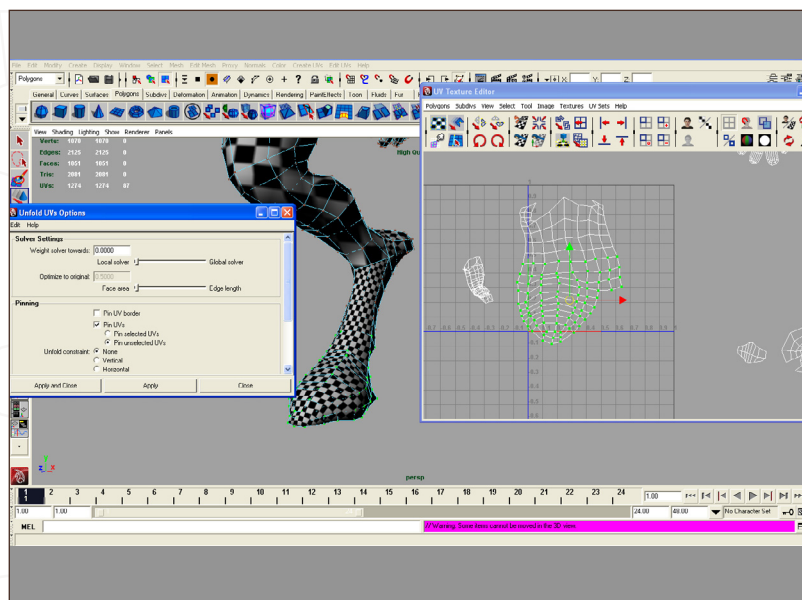
Fig 24

24. With the UVs of the foot and ankle selected, use the Unfold function that was mentioned in the head portion of this tutorial. Make sure that Pin Unselected UVs is checked. This will average out the space taken up by these UVs, leaving us with a fairly undistorted UV layout in this area (**Fig.24**).

25. Moving up the leg, select the remaining UVs and use the Unfold tool, like we have in previous steps. This will leave us with a fairly mangled set of UVs, though you can increase the Threshold and Unfold again, or you can use the Relax tool a few times with a low iteration. Once the UVs are more evenly distributed from this, manually tweak any trouble areas to reduce distortion (**Fig.25a – c**).
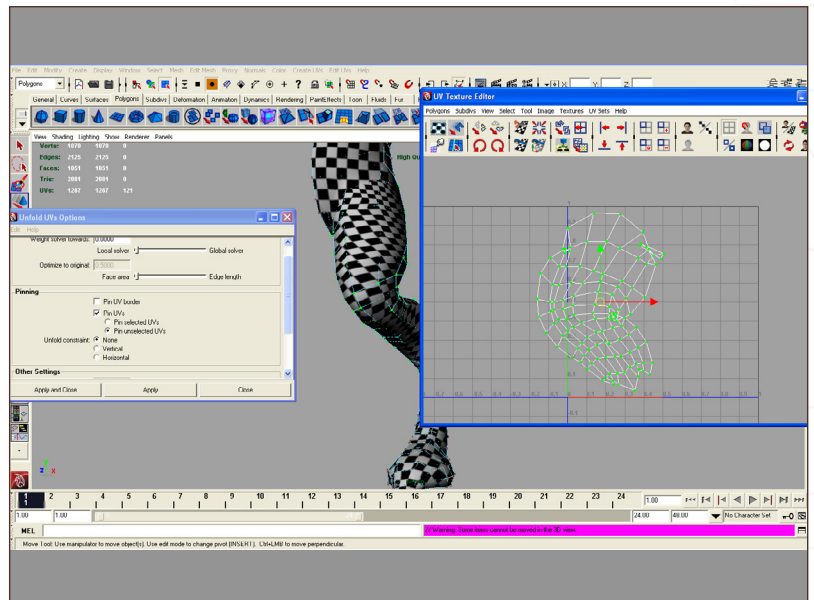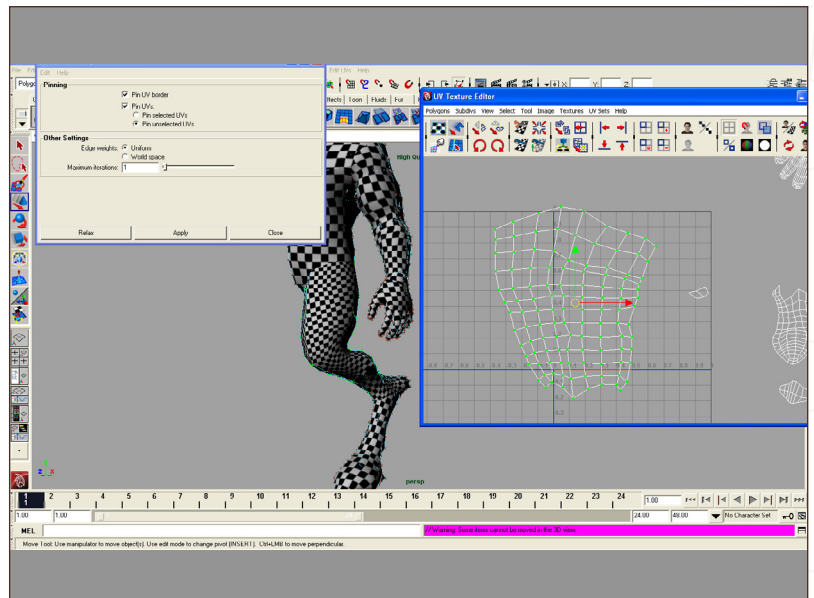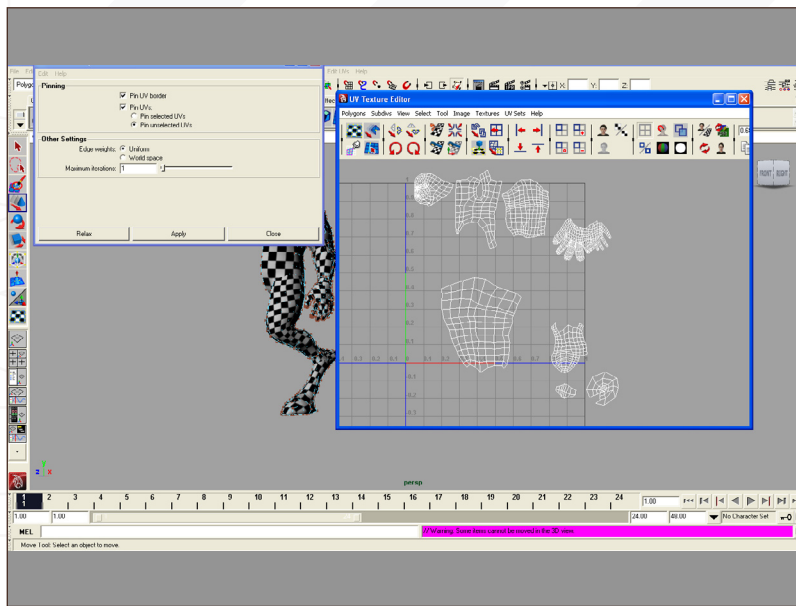
Fig 25a
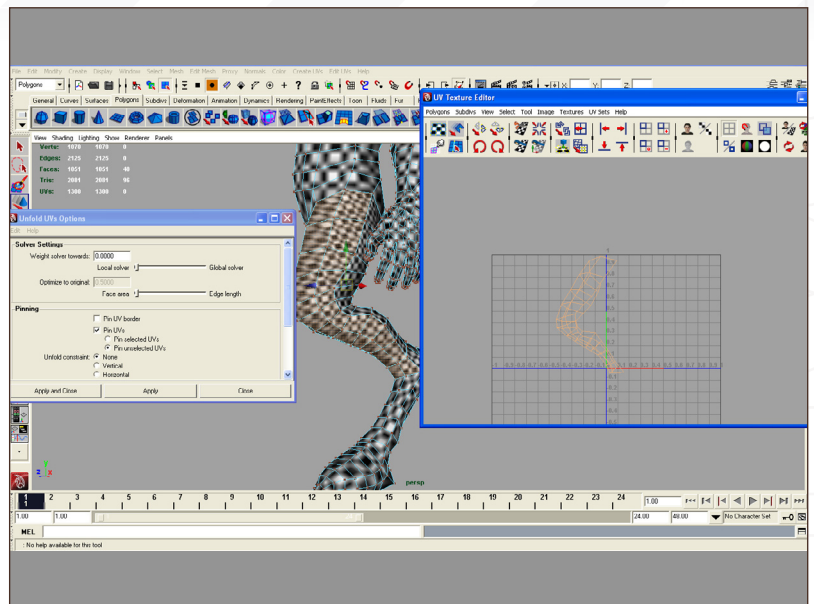
Fig 25b

Fig 25c

Fig 26

26. Now, we have all of our UV islands. At this stage I would usually select all of the UVs and, with a very low threshold, merge the UVs. This just makes sure that any UVs that may have been missed, split or simply just overlooked get welded together (**Fig.26**).
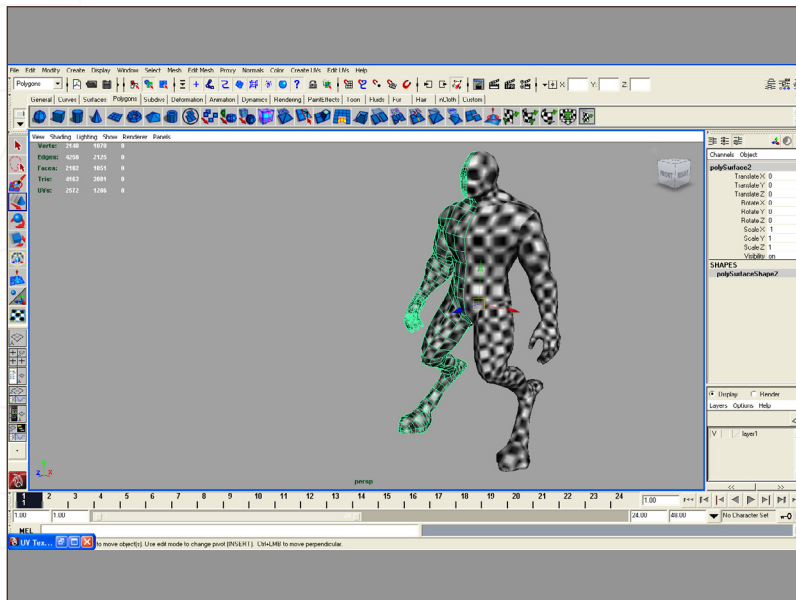
27. Now that our model is unwrapped, select the model in 3D space and duplicate it by pressing Ctrl + D. In the Channels box, on the right hand side, enter -1 in the Scale X value. This will mirror the model on the X-axis. This will not, however, mirror our UVs; this is something we will need to do manually.
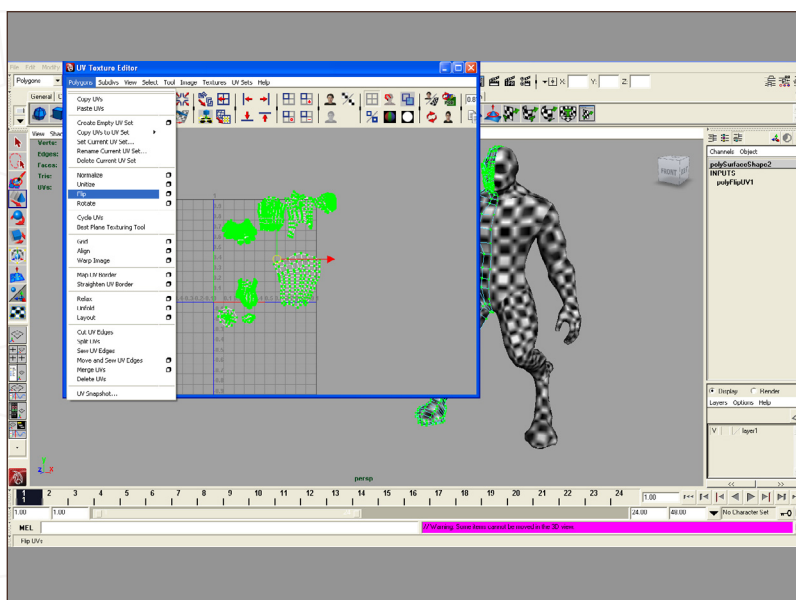
Since we are going for a totally unique unwrap for this character (no overlapping UVs), we will need to move the UVs of this new half so that we can stitch the two halves together. Select the newly created model and in the UV Texture Editor, and select all of the UVs. With all of the UVs selected, scroll to Flip (Options) under the Polygons menu. Make sure that Horizontal is checked, and select Flip. You will notice that, much like your model did in 3D space, the UVs are now a mirror image of what they once were. Move these UVs far off to the side so that they will not overlap with other half's UVs when we merge the models (**Fig.27a – c**).

Fig 27c
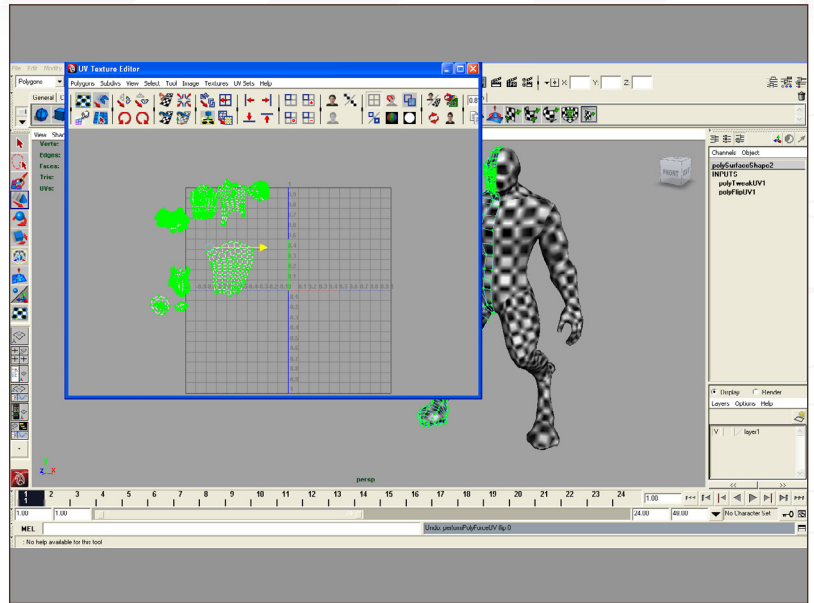
28. Select both models, clear their history, freeze and reset their transformations, and then combine them (Mesh > Combine) and clear the history again. Once the model has been merged together, select the vertices that make up the model's seam (the vertices running down the center of the face, chest and back) and merge them together. This will allow us to weld their corresponding UVs together.

In the UV Texture editor, you will now see the UVs for both halves. Move one half of the head so that the edges running down the center of the face are overlapping, and merge the UVs. Repeat this process for the chest. This will leave us with a seam running down the character's back and around his neck, which is intentional (**Fig.28a – b**).
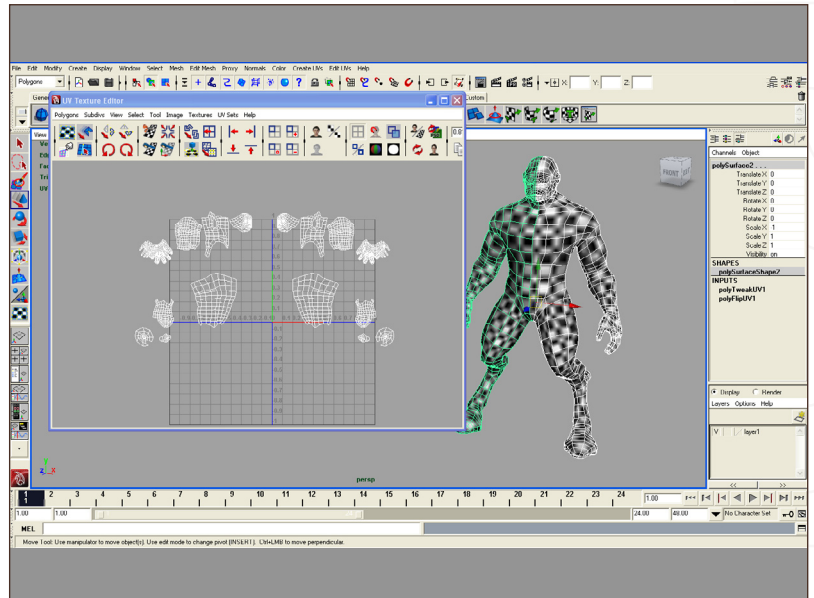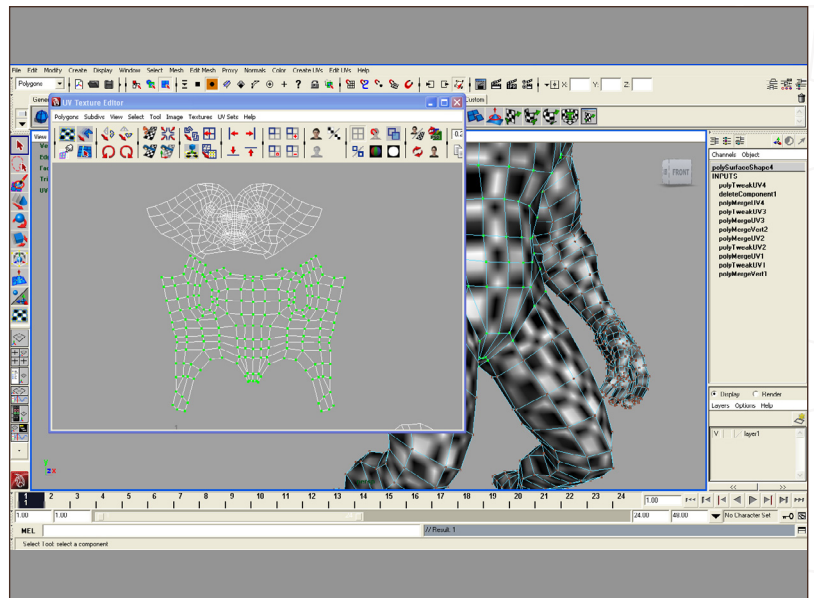
Fig 28a

Fig 28b

29. Generally speaking, you can lay your UVs out however you wish, as long as they are not breaking any sort of regulation that the technology you are using requires (overlapping UVs, UVs outside of the 1-1 square, etc.). Personally, I try to keep related elements close to each other for easier readability. I also try to keep all of my elements flowing in the same direction – excluding special cases where rotating the island around will make the space I am using more efficient, such as the upper legs on this character. Just try to keep the density of the UVs the same through the model, making sure the checkers are roughly the same size (**Fig.29**).
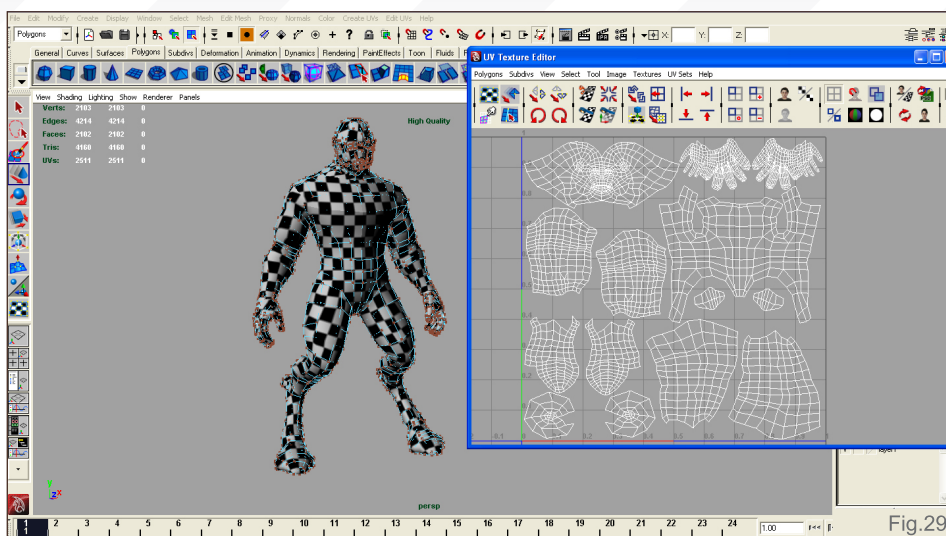
30. In the future, I am going to want to use this UV layout as a guide for my texturing. To export the UVs as an image, I go to Polygons > UV Snapshot and enter the settings that work best for me. I will be painting at 2048 resolution, I prefer to use the TGA image format, and I choose a name in my character's texture directory with an appropriate name. Once these

Fig.29

settings are entered, I hit OK and save out my UVs (**Fig.30**).

Now clear the model's history, save, and get ready to texture!

Creature Concept by: Richard Tilbury
Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by Gavin Goulden for Maya

Tutorial by:
GAVIN GOULDEN
For more from this artist visit:
http://www.gavimage.com
Or contact them:
gavin@gavimage.com

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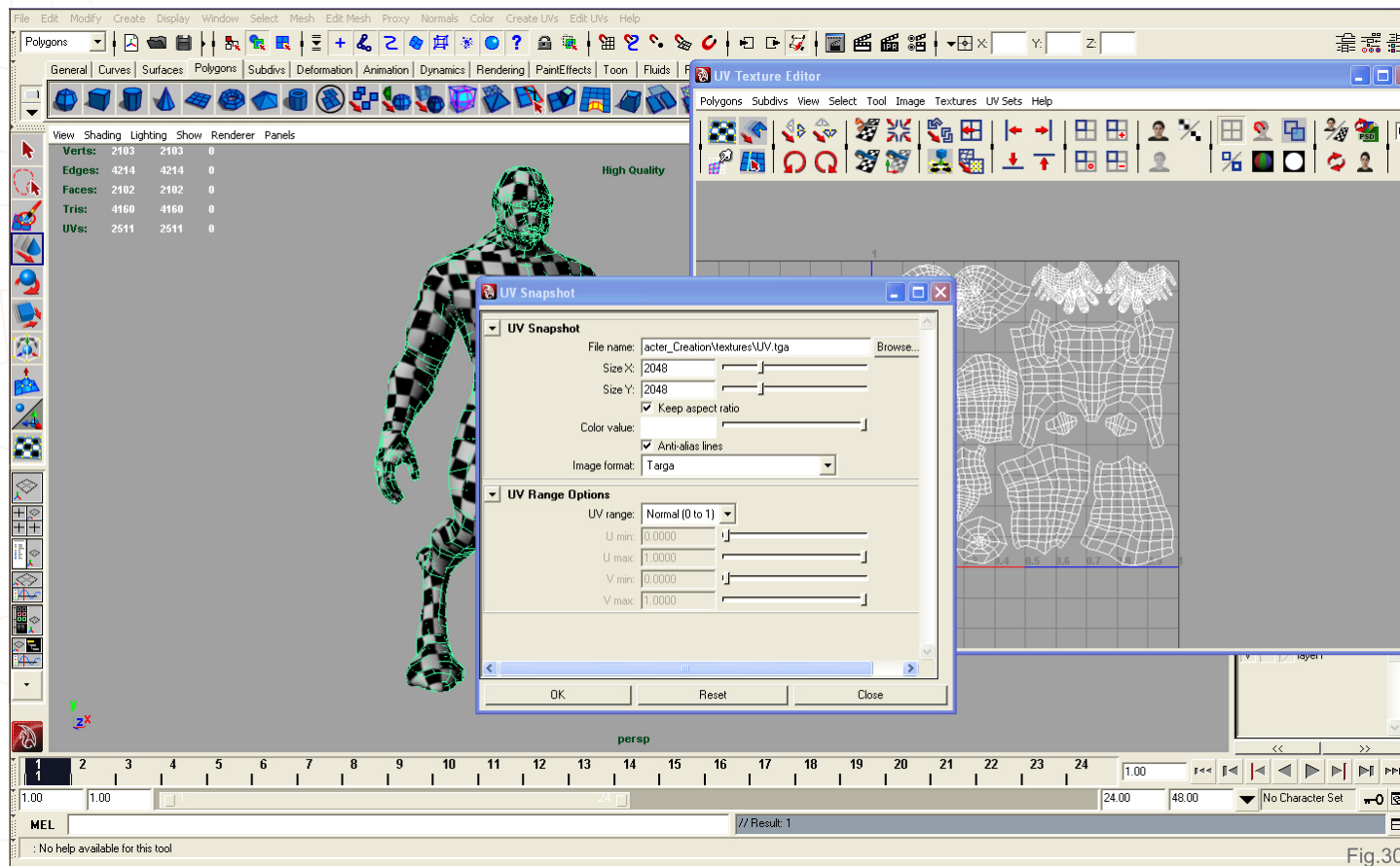
– FREE LOW POLY MAPPED BASE MESH

Fig.30

modo

NEXT GEN
CHARACTER
CREATION SERIES

This series of tutorials provides a comprehensive guide through the process of creating a 3D character intended for use within a next gen console environment. As such, the design of the model will be tailored towards the eventual aim of functioning within a game engine and viewed in real-time. The series will cover all of the key stages of the 3D pipeline from sculpting the initial mesh in ZBrush and optimizing it in the principal 3D packages, through to texturing and applying next gen shaders. The inclusion of ZBrush tutorials will address the methods of sculpting both a low-poly mesh as well as a highly detailed version used to generate a normal map, and accompany the remaining software specific chapters that will detail topics that cover mapping, materials, lighting and rendering.

Chapter 4 – Mapping / Unwrapping

This part of the tutorial will focus on a vital part of the pipeline in readiness for the texturing phase, namely the mapping and unwrapping. It will provide an insight into various approaches to mapping and show how to go about exporting a wireframe template to be used as a guide in preparation for the next chapter.

DOWNLOAD RESOURCES

- Free Low Poly Mapped Base Mesh

CHAPTER 4 - MAPPING / UNWRAPPING

Software Used: modo

INTRODUCTION

Welcome back to our next-gen character creation tutorial series for modo. This month we will be concentrating on a vital part of the process: UV layout. This is the process of arranging the polygon 2D UV data to evenly represent the corresponding 3D polygon surface. UV unwrapping is often misunderstood and in most major software packages can be an awkward and a slow process. Within modo, the process is reasonably smooth and intuitive, as modo has some of the best UV unwrapping tools available in a major software package today. So let's get started!

1. Export your lowest iteration of the model from ZBrush. Although we started the sculpting process with a base mesh edited within modo, the mesh volume or shape might have changed slightly during sculpting, so importing our base subdivision level from ZBrush will ensure we have our latest version and will be more accurate in general.

Let's start by chopping our model in half. We only want to unwrap half of our model, as we will create symmetry later by flipping half the character's mesh and UVs to create the other side. In Polygons mode, select the character's right side, making sure all the polygons in the negative X-axis are selected. Pay close attention to the mouth area which has the highest concentration of polygons. Next, press the shortcut, Ctrl + X (top menu: Edit > Cut) to cut the selected polygons (**Fig.01**).

2. By importing the mesh into a new scene in modo, it has the model at 0, 0, 0 space with some sharp edges and others smooth. To help view the model's topology, go to the Shader Tree tab > Render, and select the base Material. In the properties, change the Smoothing Angle from 40 to 180 degrees. Now the mesh has a
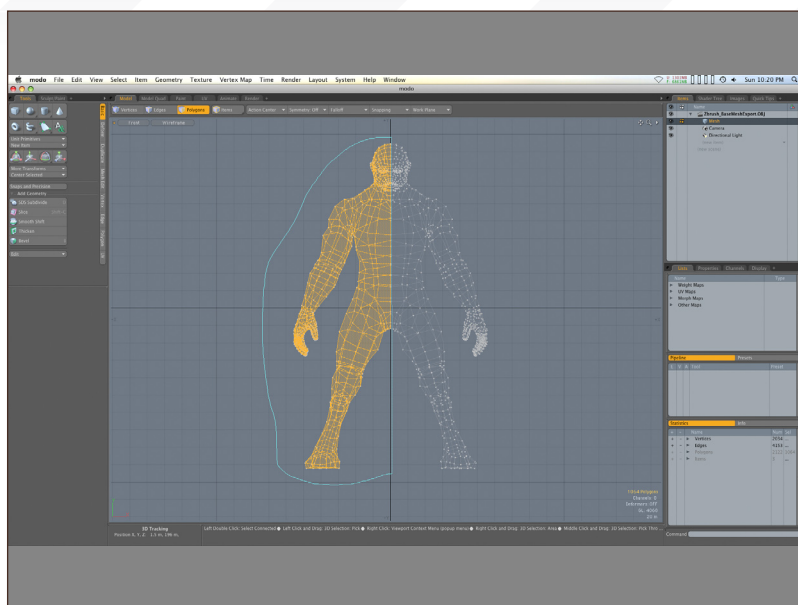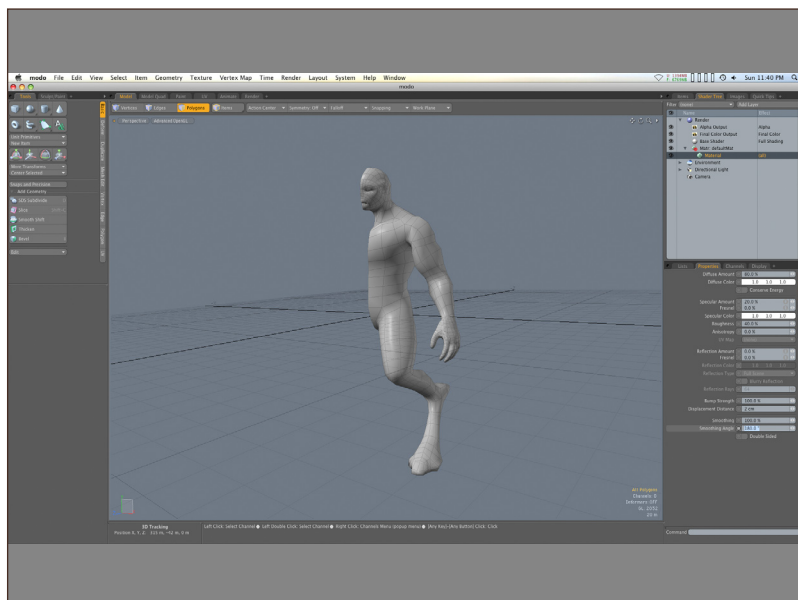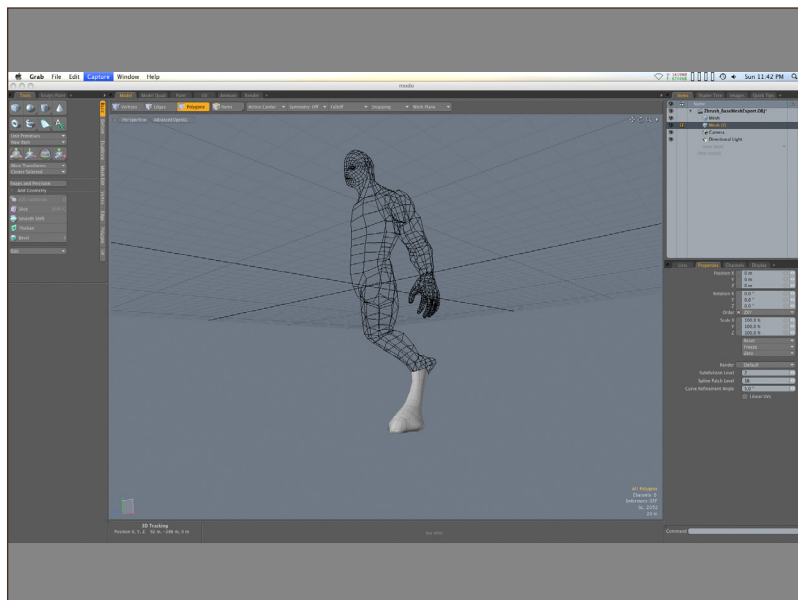

Fig 01

Fig 02

Fig 03

consistent, even surface (**Fig.02**).

3. Starting from the feet upwards, select all of the polygons of the foot, calf and shin. Next, press the shortcut, Ctrl + X (top menu: Edit > Cut) to cut the selected polygons, and then create a new empty Mesh layer and hit the shortcut, Ctrl + V (top menu: Edit > Paste) to paste the selected polygons. In modo, if you are to paste the mesh back into the same Mesh layer, the shared vertexes of the separated mesh object will automatically be merged (**Fig.03**).

4. Now select the polygons of the lower and upper leg, including most of the thigh and crotch area. Make sure to select polygons in a loop around the crotch so the seam is not unnecessarily broken and will be easier to edit later. Cut this section again using the same techniques from step 3 (**Fig.04**).

5. Move on to detaching the arm. We want to make sure we stop at the wrist and shoulders, as we will unwrap the torso and the hand separately. Select the polygons around the shoulder and the wrist in a loop, and detach the arm piece; paste them into an empty Mesh layer (**Fig.05**).

6. Things get a little bit trickier as we move onto the hand … We need to only select the half of the hand that's visible from the palm side. We also need to think about where the seam will be most visible to the player. It's no good putting the seam right on top of the knuckles because it will still be visible and very difficult to hide. Opt to place the seam along the inner edges of the fingers. This way, if the character is offering you something with the palm of his hand open, or punching you and exposing the back of his hand, the seam will not be visible. Cut the hand polygons that we have selected using the same techniques as in step 3 (**Fig.06**).
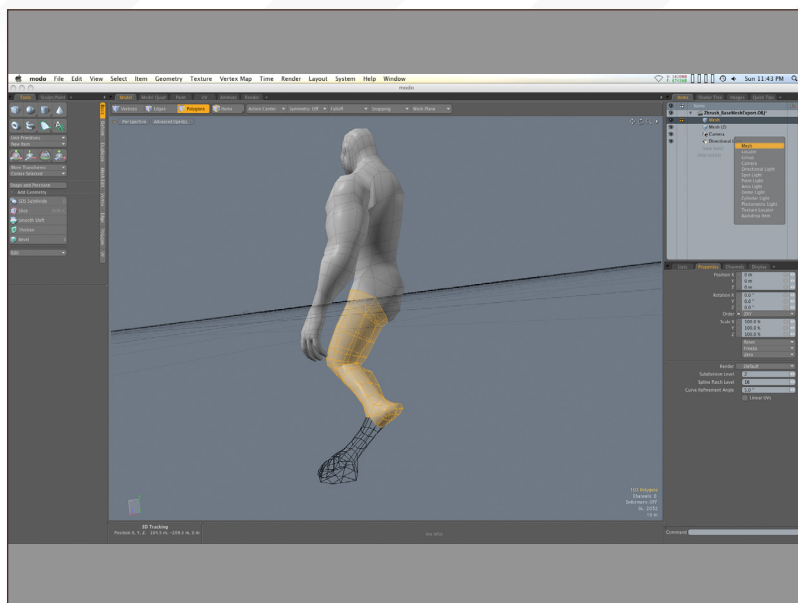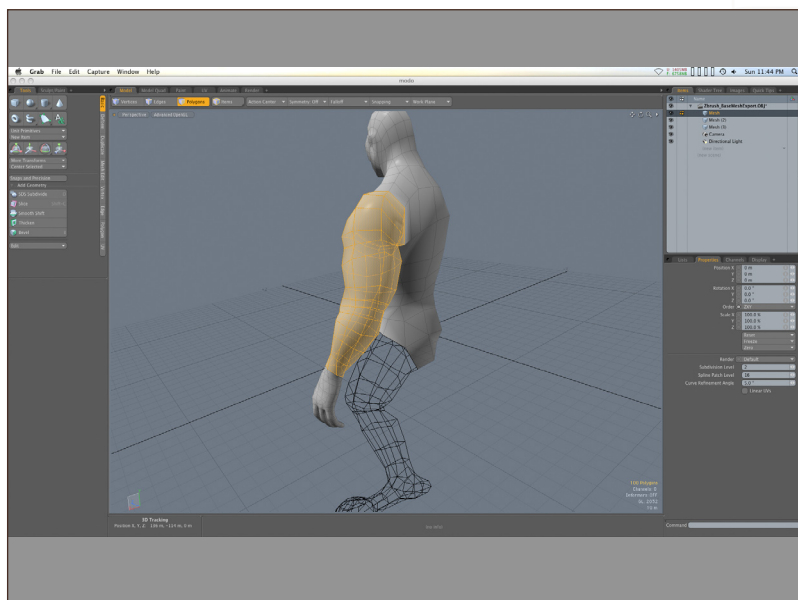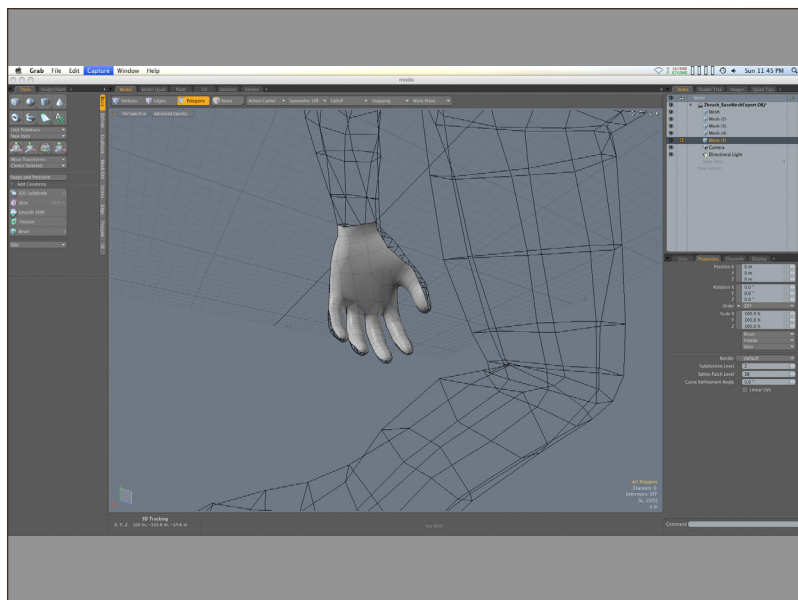
Fig 04

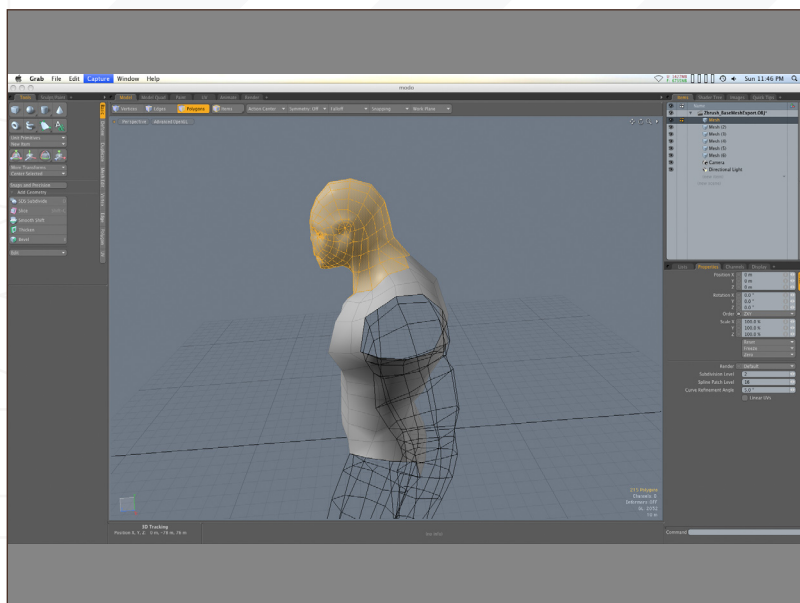Fig 05

Fig 06

Fig 07

7. We'll now move onto the head of the character. Select the polygons from the top of the head to the bottom of the neck, where the neck muscles meet the chest at the collarbone. Make sure the polygons are in a loop with no stray polygons selected. Cut the head polygons that we have selected using the same techniques as in step 3 (**Fig.07**).
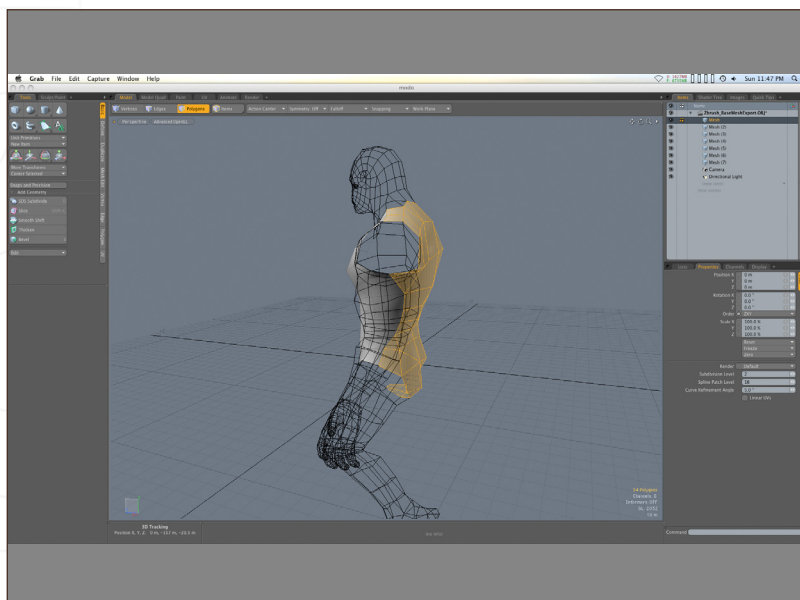

Fig 08

8. There are only two sections left to detach at this point: the front and back of the torso. Make sure the front half is cleanly selected, and then cut the head polygons that we have selected using the same techniques as in step 3. There is no need to cut the back, since as it is the final section it has already become one individual object (**Fig.08**).
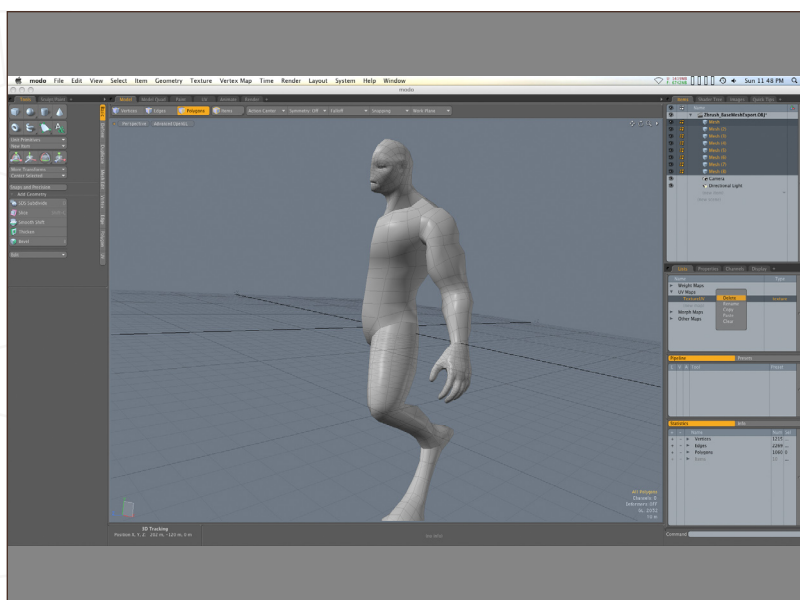
9. We can now get setup to start unwrapping each of the individual sections that we have created. In modo, it is easy to add and remove UV map sets, and before we proceed we should tidy up any extra UV sets that could have been imported with the mesh that might confuse our UV editing process.

Fig 09

With all the Mesh layers selected, go to the Lists tab > UV Maps, and delete all Map layers that are present. Next, with all the Mesh layers still selected, click on (new map) with the default name "Texture" to create a UV set that will be shared with all the Mesh layers (**Fig.09**).

10. Next we'll setup a Material with a checkerboard texture. With all the Mesh layers

selected, press the M shortcut key (top menu: Texture > Assign Material Group). Within the resulting pop-up window, leave the settings as default, and enter into the Name field, "UVchecker", and then click OK (**Fig.10a**).
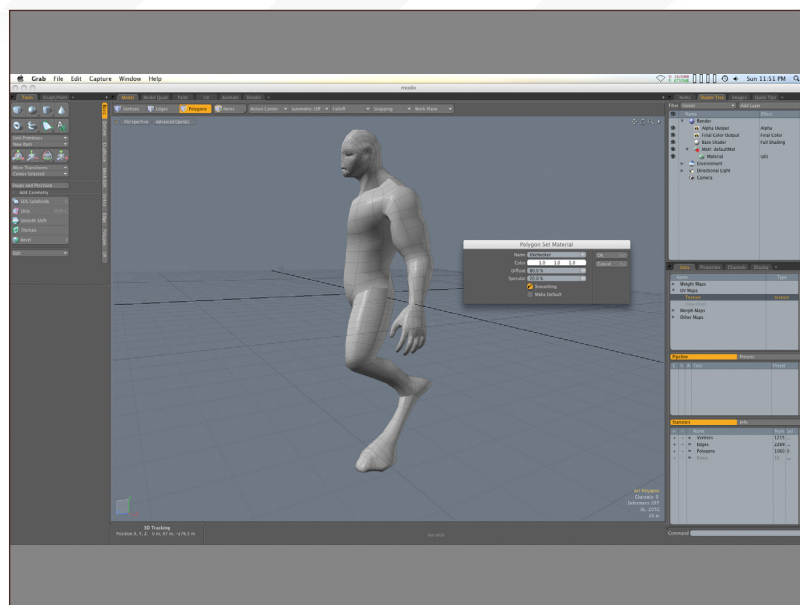
Since we just applied a new Material, you might need to adjust the Smoothing Angle from 40 to 180 degrees once more. Next, go to the Shader Tree tab on the right side and notice under Render, above the base Material, is a new Group called "Matr: UVchecker". Now we will add a checkerboard texture to the material. Select Add Layer/Image Map and navigate to the Common directory located in Images of your modo 301/302 content directory, and select "board.png" (**Fig.10b**). Since the image is applied to a mesh with a UV Map, but with no UVs created, the mesh will appear dark gray. When the UVs are projected, the checkerboard texture will then appear on the mesh.
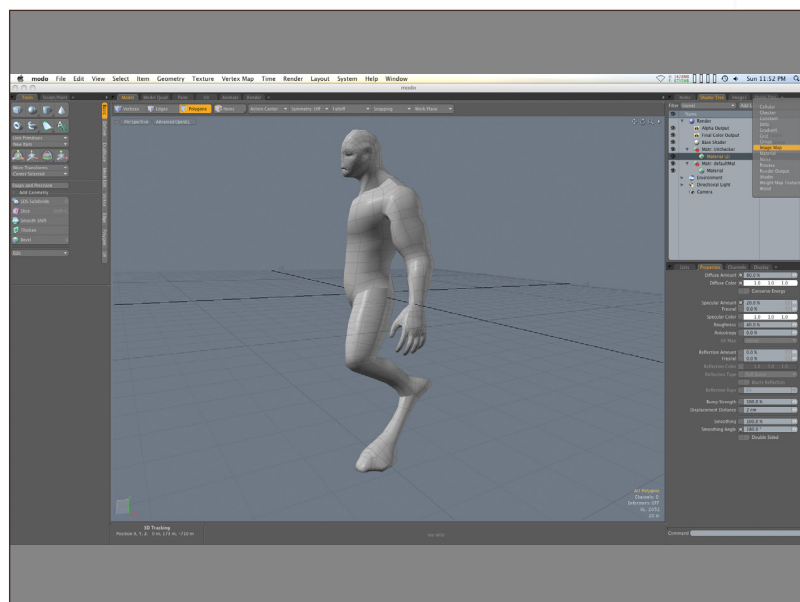
A checkerboard image is very good for judging the amount of UV space the mesh polygons occupy. A very important part of UV mapping for games is this polygon ratio. Most of the time we want to make sure all sections of the model will occupy the same amount of UV space, relative to their size. This is most noticeable when we apply a tileable normal map or bump map. If the ratios are off, the difference in the size of the bump will be dramatic between seams and will draw attention to our seam areas, which is something we must try hard to avoid.
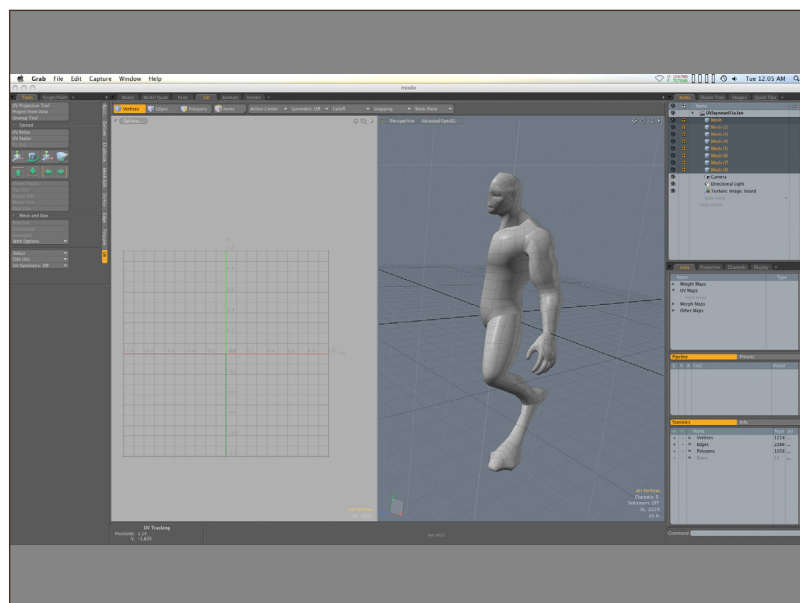
11. Next, switch from the Model viewport tab to the UV tab, and then click on Tools > UV to get to modo's UV editing toolset. Since we will be unwrapping the mesh, we need to define the edges of the UV shell. The process is comparable to the way the spherical globe has been cut at the poles and flattened out into a 2D map. We'll be performing a similar transformation, although since we're working with different shapes we'll need to define our own seams in order to create a good 2D map of the 3D poly surface (**Fig.11**).
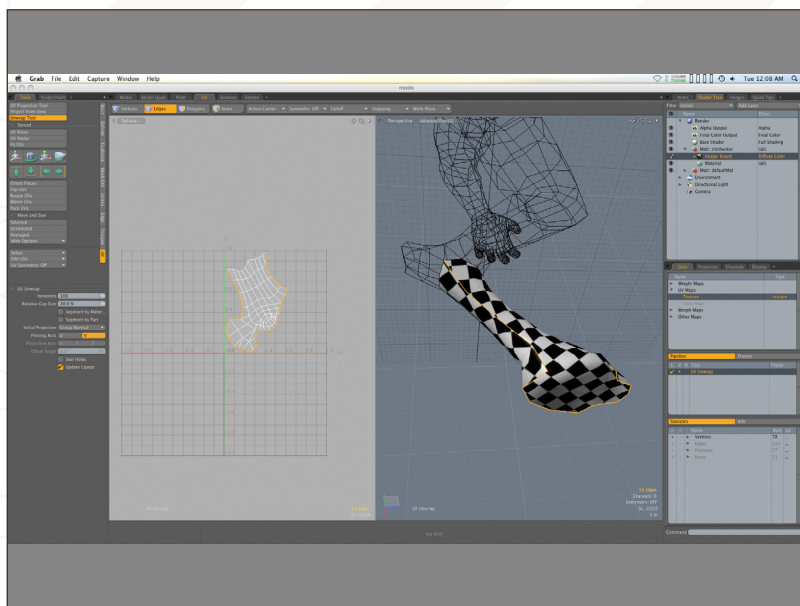
Fig 10a

Fig 10b

Fig 11

Fig 12

Fig 13

Fig 14

12. To start unwrapping, select the inside edges of the foot and bottom of the sole, like shown. With the edges selected, go to the left side UV and Vertex mapping panel and click on the Unwrap Tool. In the tool properties > Initial Projection, I use Group Normal with a Pinning Axis of V and 100 Iterations; however, your settings might vary slightly to get a similar result. All these settings are interactive when active. For example, by click-and-dragging up and down on the arrows next to the Iterations box, we can view the mesh as it unwraps in the UV window. modo will also display polygons as shaded red if any of the UVs are overlapping; however, by adding more iterations it will usually remove overlapping/red shading. By examining UVs in the center window, as well as the checkerboard pattern on the mesh in the perspective window, you can adjust the settings to get the checker pattern looking evenly distributed upon the model surface (**Fig.12**).
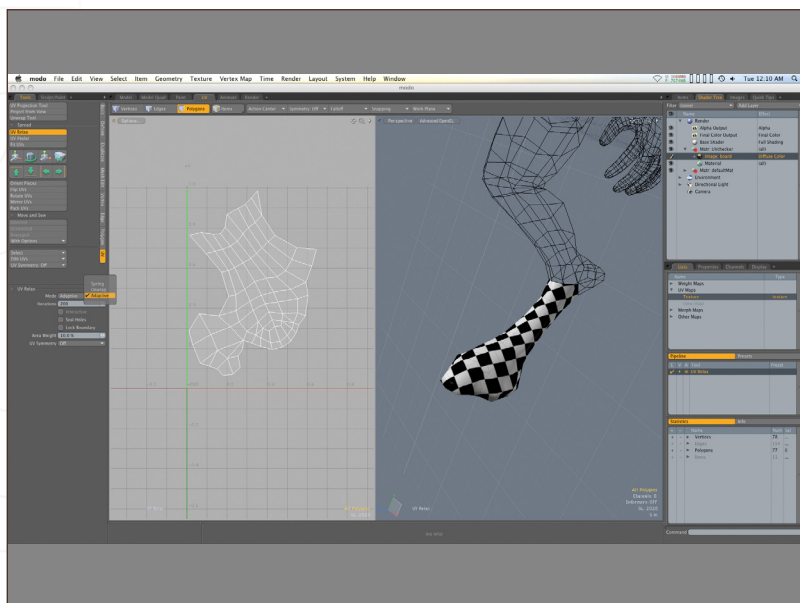
The Unwrap Tool will be the tool we use most for this tutorial and is more advanced than the standard Pelting methods, since it doesn't introduce as much distortion to match the size of the polygons in the actual model. This provides modo with a quicker solution to get you to painting and texturing, compared to many other methods.
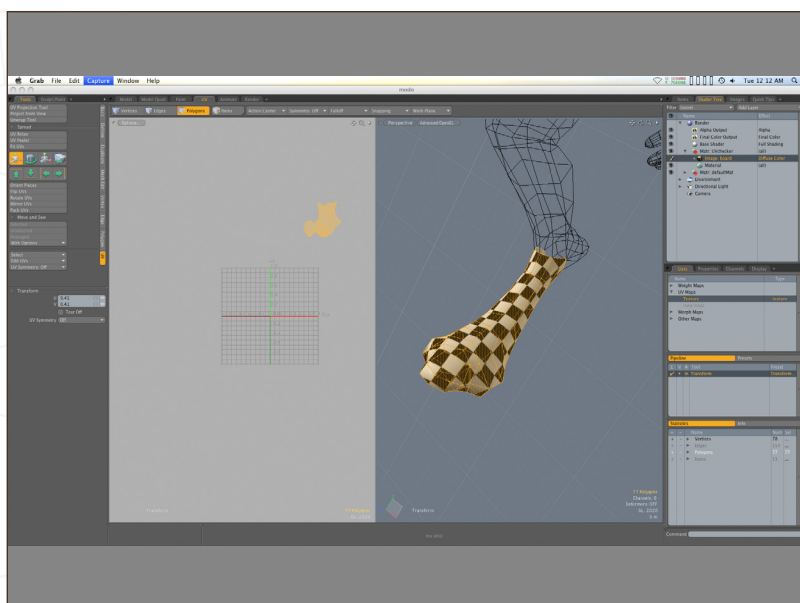
13. The Unwrap Tool usually does a really good job; however, for complex shapes, additional UV adjustment can help the UVs become even more evenly distributed. Start by deselecting the edge and click on UV Relax. In the tool properties, set the Mode to Adaptive and Iterations to 100-200, and then click into ether viewport. Good UV unwrapping is a combination of minimizing texture stretching as well as minimizing and hiding UV edges. For more organic shapes I try to have all the parts of the unwrapped UV shell connected at least at one UV edge so the parts will be better organized in the overall UV layout. Each part may have its own unique priority between the amount of stretching (if any), the number of edges, and edge visibility (**Fig.13**).

14. In Polygons mode, double-click the shell to select it and move it off of the UV 0-1 space. We don't know exactly where it will go yet; however, modo will project all the UVs within the 0-1 UV space, so move each section over as it is created, to avoid overlapping and to make it easier to select and edit later on (**Fig.14**).
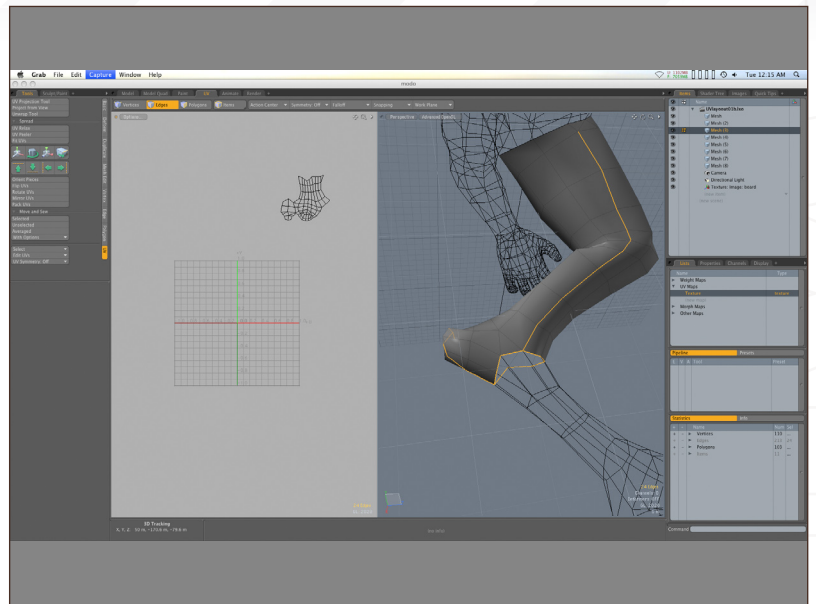
15. Move onto applying the same techniques as in steps 12-14 to the other parts of the model now, working your way up from the bottom to the top. Select the seam that goes all the way up the inside of the leg, and the connected edges and the heel, as shown (**Fig.15a**). It's important again to choose a seam location that will not be visible to the viewer, but in the case of the seam at the heel, outside seams are inevitable in order to get a good unwrap.
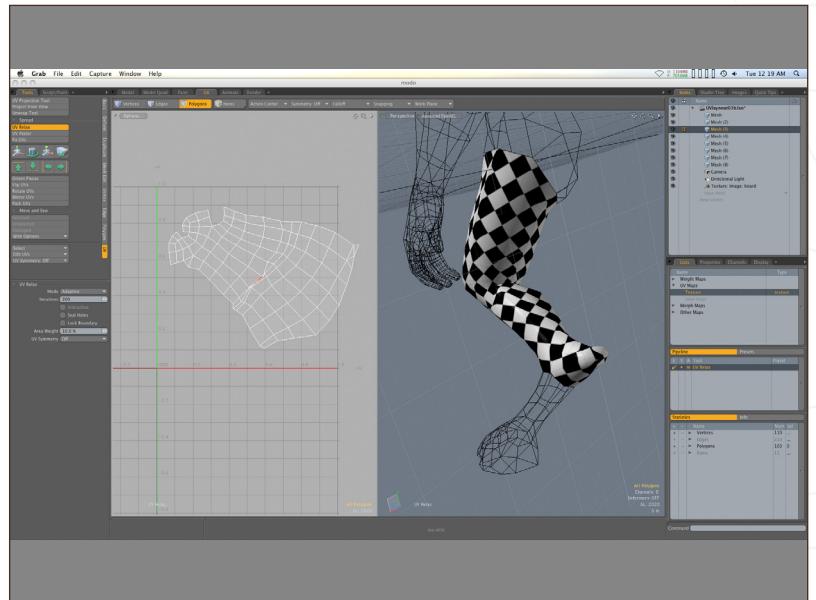
After using UV Relax, some UV overlapping might occur (**Fig.15b**). By selecting the affected polygons and using UV Relax in Spring Mode with 3 or 4 iterations, any overlap should be removed whilst maintaining an even distribution (**Fig.15c**).
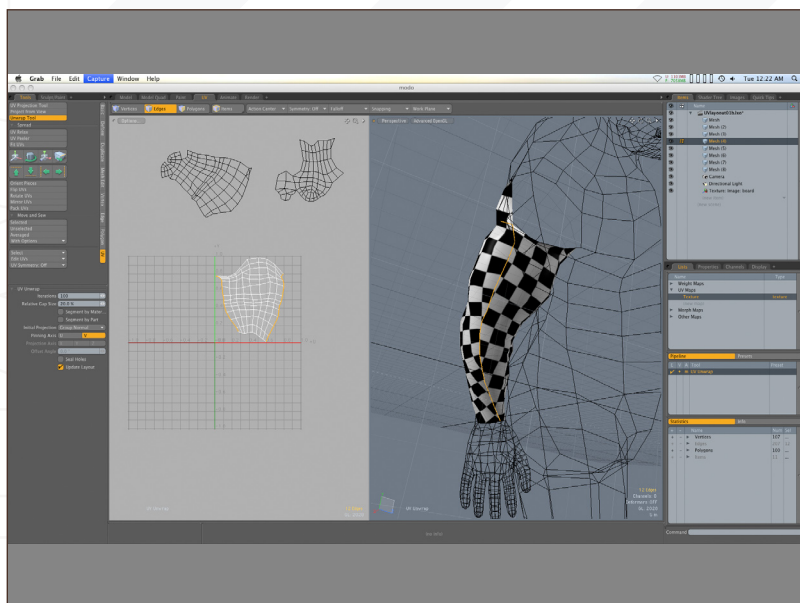
Fig 15a

Fig 15b

Fig 15c
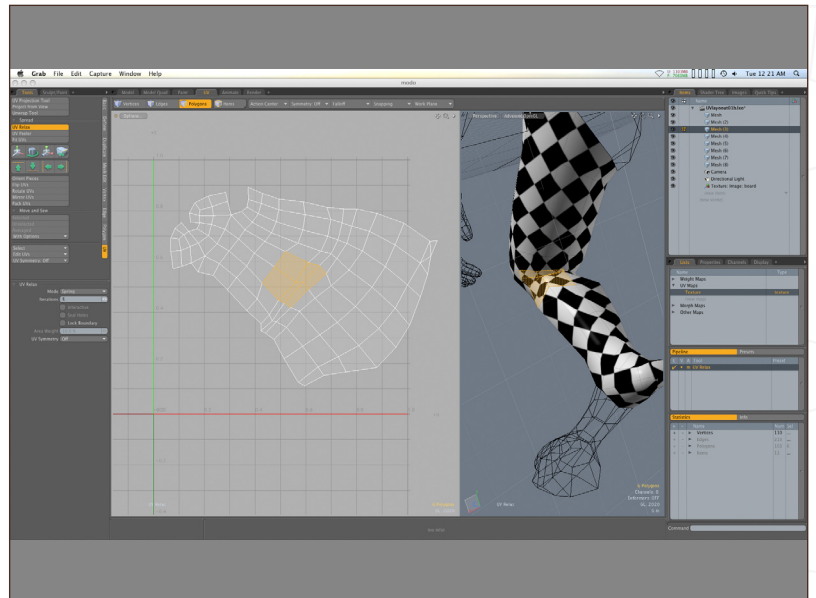
Fig 16

16. The arm is very easy to unwrap – use the edge as shown – as unwrapping will be very similar to the foot (**Fig.16**).
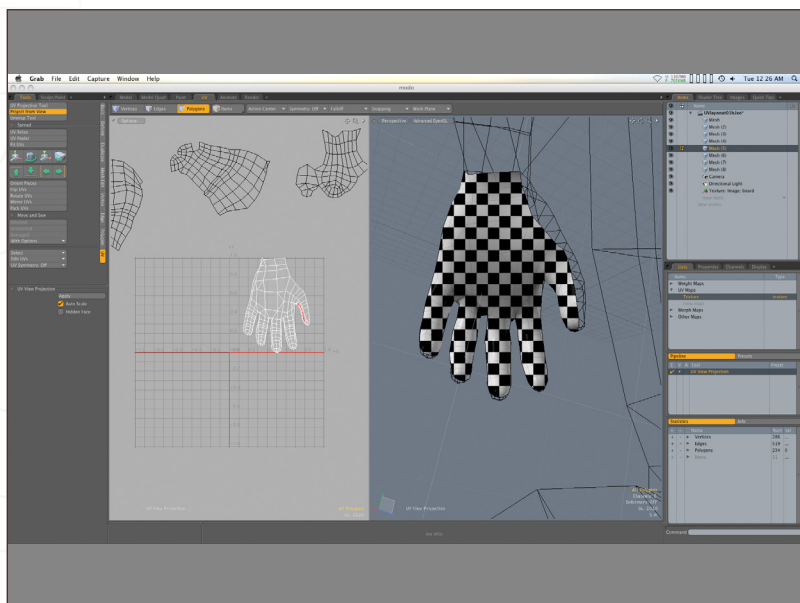

Fig 17a

17. For the hands, use Project from View instead of unwrapping, as the hand is a relatively planar shape and I prefer to project the hand UVs into one front piece and one back piece. Align the 3D viewport to an angle of the hand that is fairly flat, and then click in the viewport (**Fig.17a**). Next, use the Element move (T shortcut key) to quickly pull out only the overlapping outer edge points to maintain the hand UV silhouette (**Fig.17b**). Finally, use the UV Relax set to Adaptive with Lock Boundary turned on (**Fig.17c**). Repeat this process for the top of the hand.
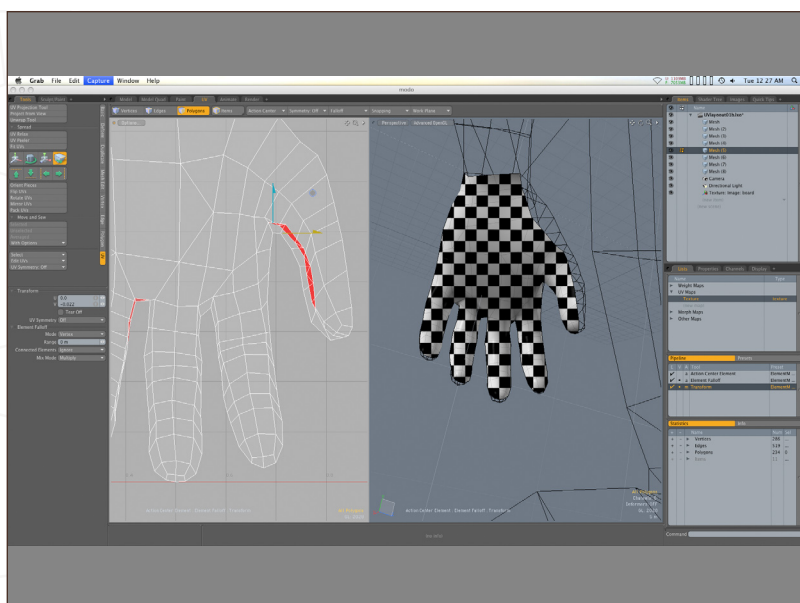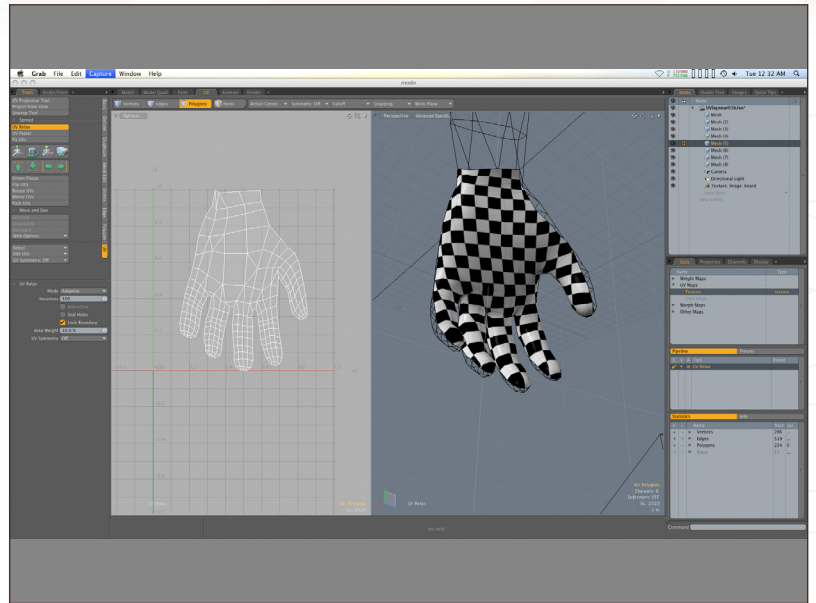
I have found that setting up hand UVs in this manner is much more efficient that using a pelting method that can result in a more "starfish" shape. The UVs will use the space much better, and projecting photo textures onto the mesh will align the texture in a quicker and more natural way.


Fig 17b

Fig 17c

18. Next we will mirror the torso and head parts so we can project the UVs onto both halves at the same time, and limit the seam to the torso sides and the back of the head. Unwrapping both sides at the same time can help to keep the center of the mesh even and reduce the number of steps later on. So select the head mesh and make sure the center-line vertexes are all at 0 on X, and then go to Tools > Duplicate > Mirror. Apply the same process to the front and back torso parts (**Fig.18**).

Fig 18
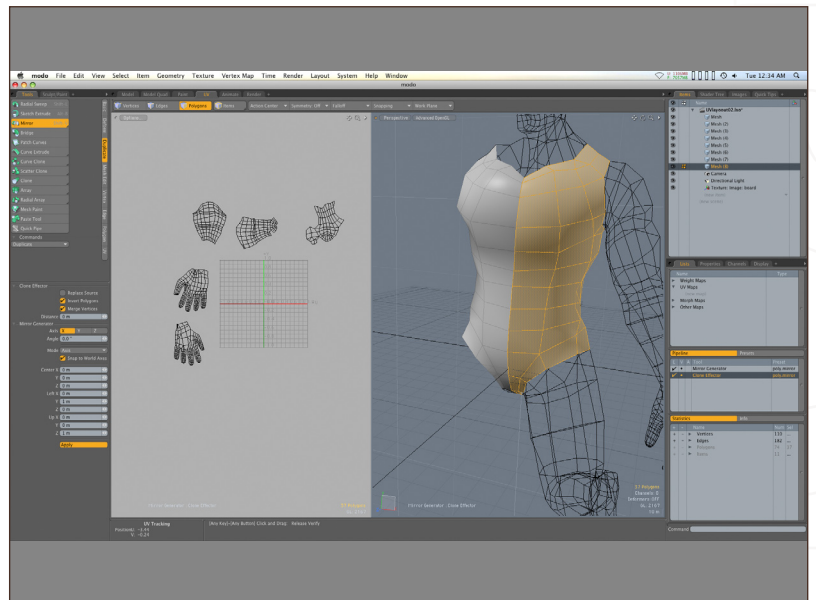
19. Unwrapping the torso parts is easy, simply follow the same techniques as in steps 12-14. I use Group Normal on V for the torso parts, and Planar with Pinning Axis on V and Projection along Z. I use UV Relax to finalize the unwrap (**Fig.19**).
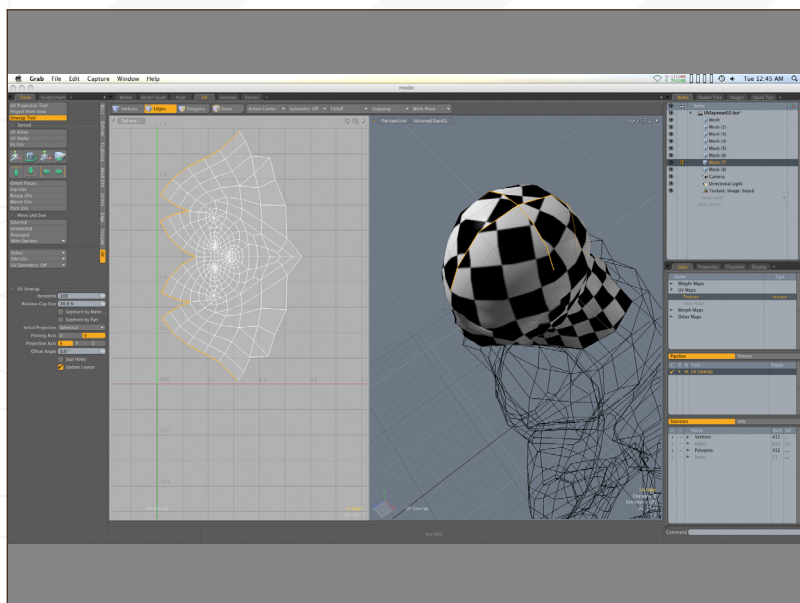
Fig 19

Fig 20

Fig 21

Fig 22
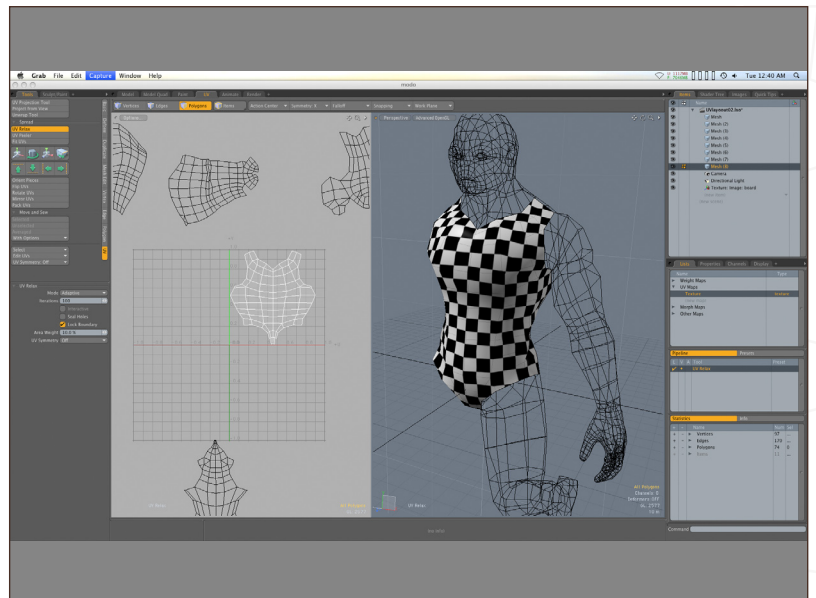
20. Unwrapping the head is reasonably quick, as well. Start by selecting only the edges on the back of the head and across the top, leaving the center on the face and front neck unselected. Next follow the same techniques as in steps 12-14; however, this time note that I use Spherical as the Initial Projection, Pinning Axis V, and Projection Axis as X (**Fig.20**).
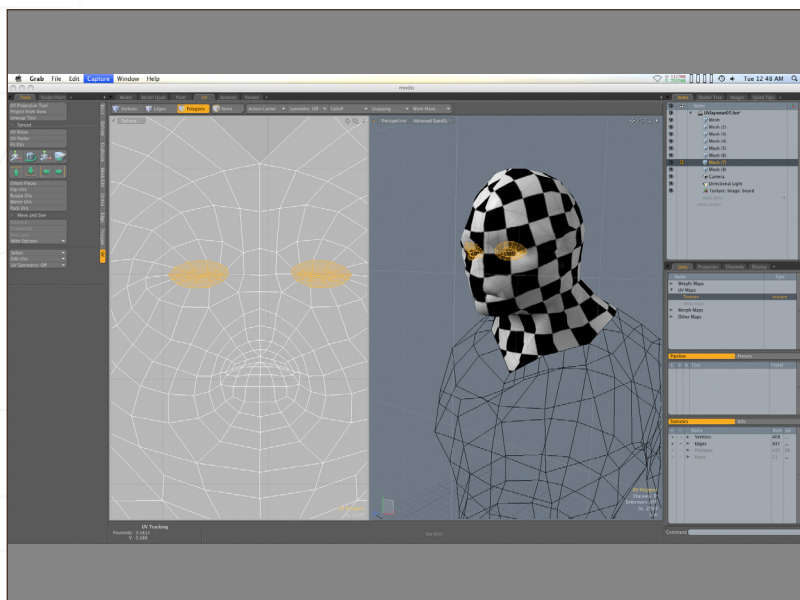
21. Once you have the head unwrapped and have straightened out the distortion, we can work on optimizing it for painting the textures. The first area to work on is the eye socket. As our eyeball is a separate texture we will not be painting it into this map. This means we can use the whole of the eye area to cover the upper eyelid and give us a little more resolution on this highly detailed area. Select the polygons in those areas and scale down the areas to provide a bit more pixel space on the outer surface, as shown (**Fig.21**).
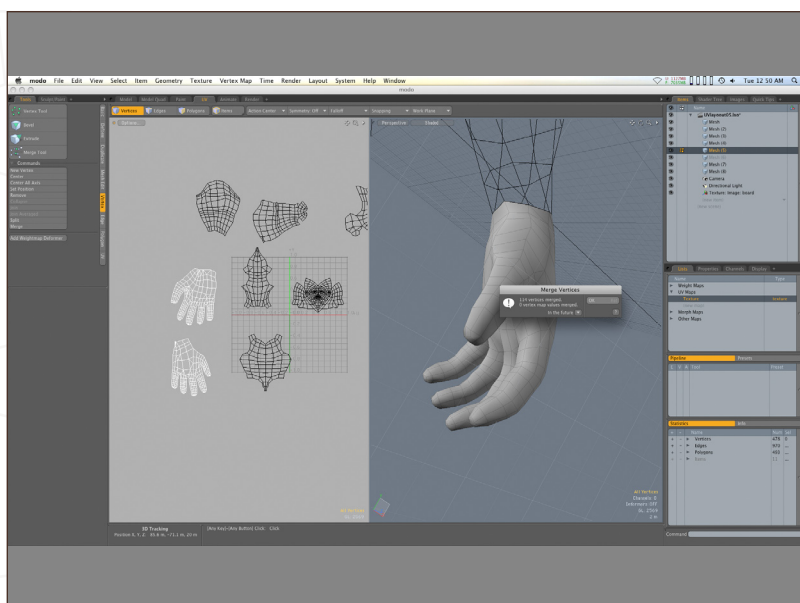
22. Finally, all the parts are unwrapped and we will proceed to bring together some of the separate meshes and UV shells to try and reduce the number of UV edges, as well as making sure the UVs are oriented to match the polygons, and not backwards. Start by selecting the top hand mesh, press the shortcut, Ctrl + X (top menu: Edit > Cut) to "Cut" the selected polygons, select the bottom hand mesh, and then press the shortcut, Ctrl + V (top menu: Edit > Paste) to past" the selected polygons. If the vertexes along the edge don't automatically merge, go to Tools > Vertex > Merge with Range set to automatic. Do not merge the vertexes or edges manually as that might affect your UV shells, and could cause their edges to be joined (**Fig.22**).

23. We will connect the hand UV shells along the thumb side now as it's usually much more visible than the backside. Arrange the shells as shown, and then in Polygons mode select one of them (**Fig.23a**). Next, go to Tools > Deform > Soft Drag, and adjust the edges so they more closely match; the outer edge points are the most important. When the edges are reasonably close to each other, select the edge, as shown, and go to Tools > UV > Move, and Sew > With Options > Sew; keep Average and click OK (**Fig.23b**). Clean up the shell by once again using relax, but only with 10 or so iterations.
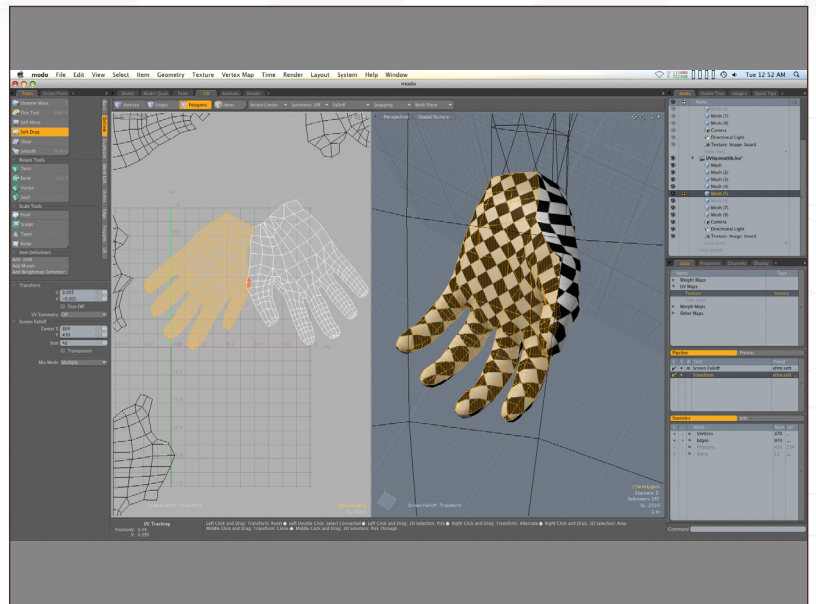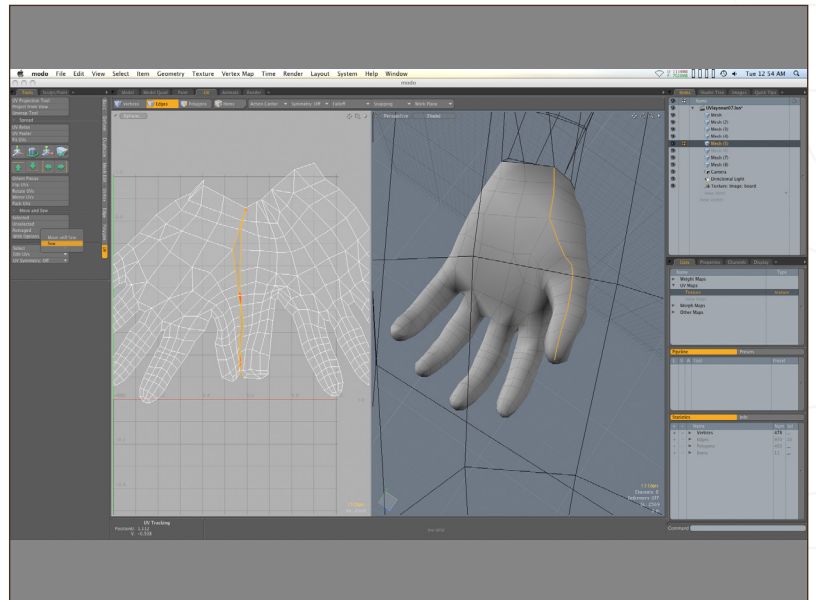
Fig 23a

Fig 23b

24. Repeat step 23 with the torso, and connect one side; I've connected the right side (**Fig.24a**). To make sure the UVs are symmetrical after smoothing, I delete the body half that was not connected (the left side), mirror the geometry, then offset and reconnect the front center UVs and back center UVs. Relax is used once again, and I make sure that Lock Boundary is activated (**Fig.24b**).
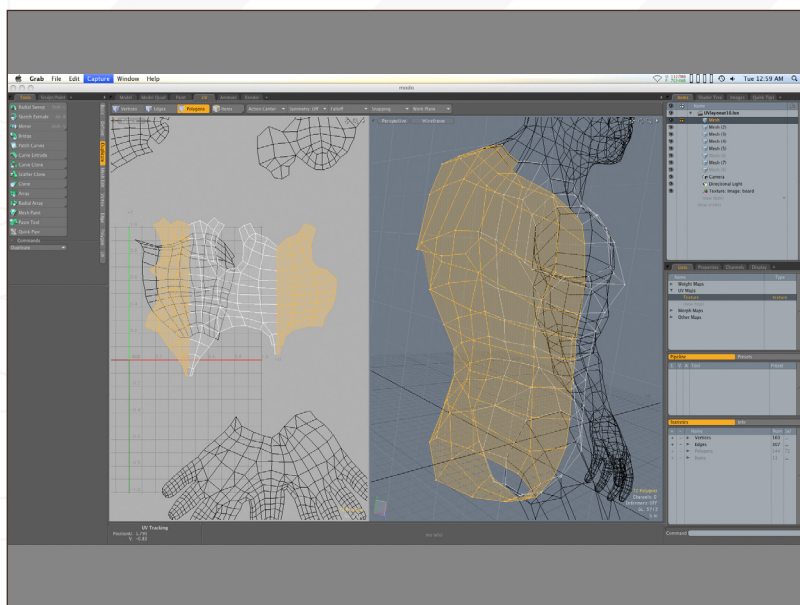
Fig 24a

Fig 24b

Fig 25

Fig 26
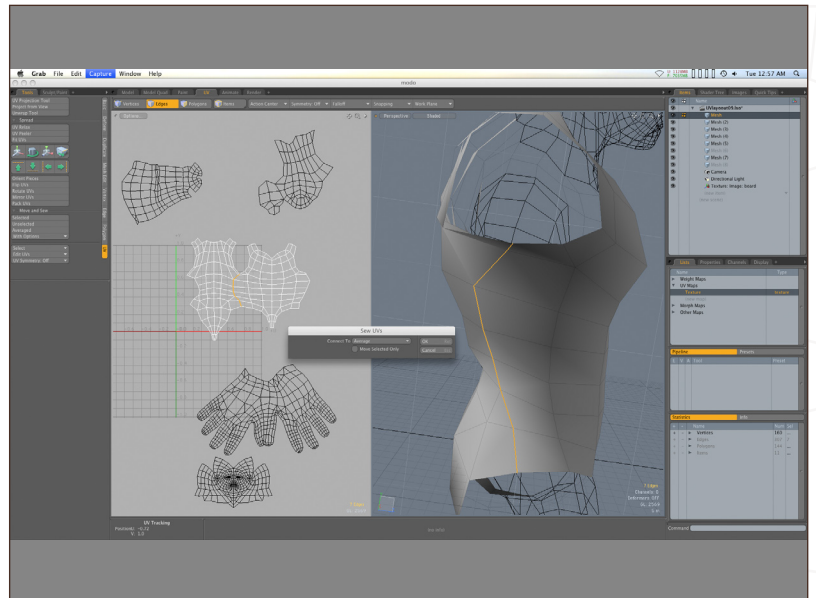
25. Next, we'll mirror over the hand, arm, and leg, making sure to also scale the mirrored UV shells by -100% on the U so their UVs are not backwards. Once finished, select all the mesh layers and cut and paste them into the same mesh layer. Use Tools > Vertex > Merge with Range set to Automatic or Fixed to join any vertexes not merged (**Fig.25**).

26. Next, go to Tools > UV > Pack UVs. With all the options selected and Direction set to Auto, click OK. This will scale all the shells to match each other and fit them into the UV 0 to 1 space (**Fig.26**).

27. The Pack UV function usually leaves a lot of empty space, but it's a good starting point towards finding the best way to position all our pieces so very little wasted space remains. I start by scaling up all the parts by about 25%, as the empty space seems to be about 25-35%. Another consideration is that for most characters, the head and hands are the most important, with other areas such as the feet being less interesting, so often it's a good idea to scale up those areas slightly more than the others to help their detail – but not so much that you cause the connected seams to become more visible.

The less space there is, the higher the resolution we will get for our textured pieces. If you're not the one doing the texturing, it's nice to make everything clean and understandable. It's best to keep fingers and thumbs together, rather than scattered around the document in random pockets of unused space. It's also a good idea to keep things the right way up. Make sure the head and body are upright – and the back, too. It's not always going to be possible to have everything right-side up and it's certainly OK to have one arm upright and the other upside-down. The same goes for the legs and hands, as this can sometimes help with fitting things together. However, try to keep everything as organized and clear as possible (**Fig.27**).
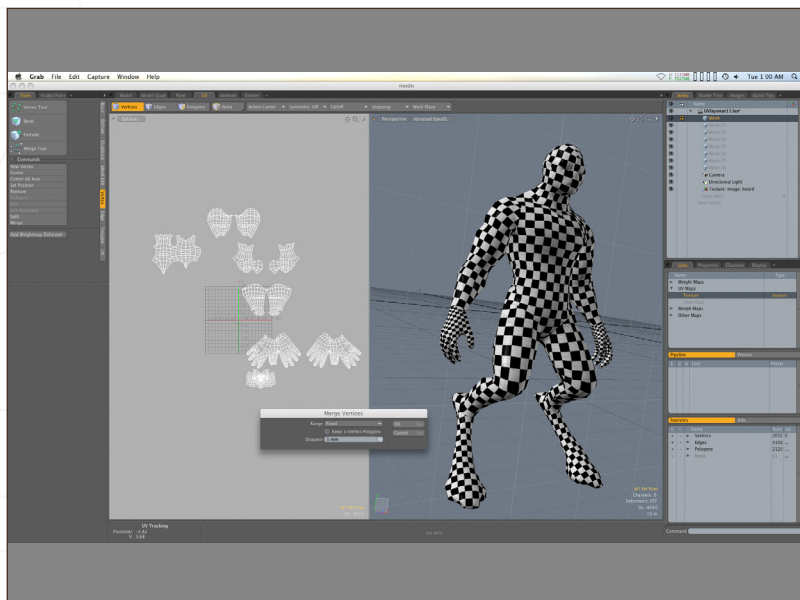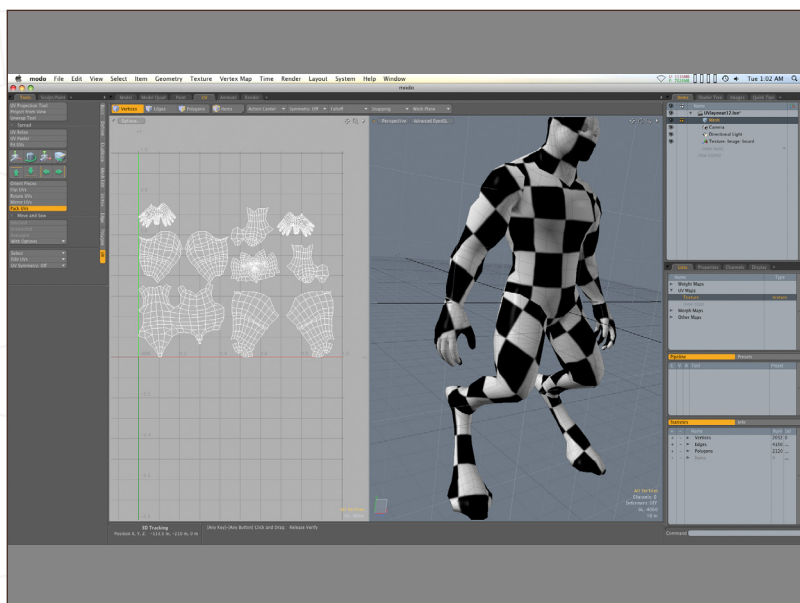
Complete the jigsaw now, remembering to leave a little space for the accessories and UV edge bleed. The metal chains and the weapon will need to fit in later if you decide to put them on the character texture sheet. If the accessories will be reused across many other characters then it often makes sense to put them on their own smaller map. It's also better to put them on a smaller map if they have an alpha channel, as it's a waste of a full-size alpha channel texture if it's only for one object on the map.

28. As a final step, we should generate a UV Template that we can use to overlay our texture in Photoshop. It will help us remember where our borders are, and will give us a good guideline to paint on in addition to our lighting baking solution. With the texture map selected in the UV maps list, go to the top menu > Texture > Export UVs to EPS. Save a resolution independent UV EPS template (**Fig.28**).

Our character is now well on its way to being brought to life. It has been modeled, sculpted, and now unwrapped. Unwrapping can be a tricky business and may seem somewhat uncreative and monotonous, but like any craft, there are
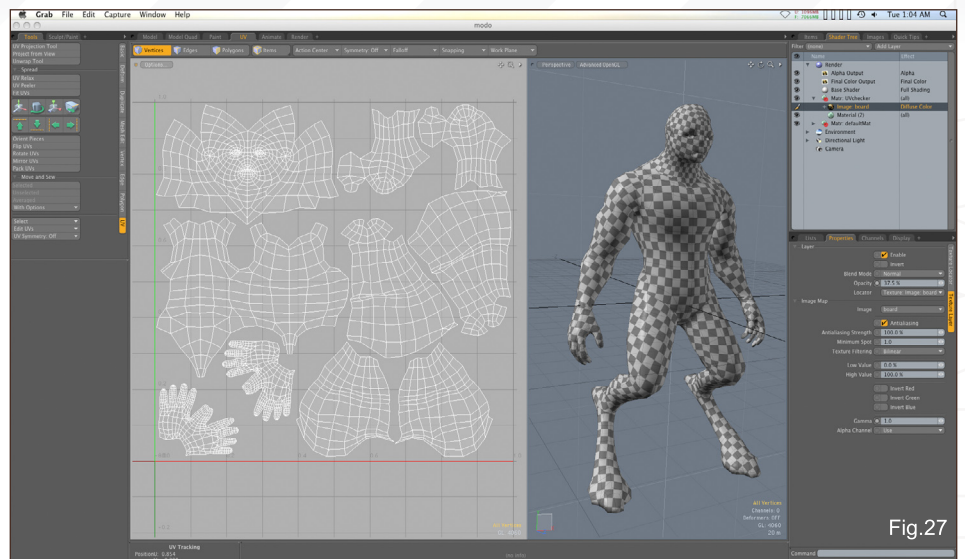

Fig.27

parts that just need to be done, and done well, to enable the next phase to run smoothly. I hope that you've learned that it need not be as complex as it seems. An unwrapped model can be heaven or hell for texture artists, and it's an extremely important skill to learn for life in the games industry!

Creature Concept by: Richard Tilbury
Tutorial originally created by Joseph Harford in ZBrush & 3ds Max; translated by John Hayes for modo

Tutorial by:

John Hayes

For more from this artist visit:

http://zugok.cgsociety.org/

Or contact them:

zugok@sbcglobal.net

DOWNLOAD RESOURCES

- Free Low Poly Mapped Base Mesh

Fig.28